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Search History

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DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR

<u>L16</u>	"electronic brokering services limited".as.	0	<u>L16</u>
<u>L15</u>	"ginsberg, paul".in.	2	<u>L15</u>
<u>L14</u>	"mcpherson, roy".in.	2	<u>L14</u>
<u>L13</u>	"krishnasami, srivathsan".in.	2	<u>L13</u>
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<u>L11</u>	"walder,robert".in.	0	<u>L11</u>
<u>L10</u>	"mills,gregory".in.	0	<u>L10</u>
<u>L9</u>	705/39	1574	<u>L9</u>
<u>L8</u>	705/38	856	<u>L8</u>
<u>L7</u>	705/35	2036	<u>L7</u>
<u>L6</u>	705/37	2110	<u>L6</u>
<u>L5</u>	l3 and L4	19	<u>L5</u>
<u>L4</u>	705.clas.	33506	<u>L4</u>
<u>L3</u>	L2 and (securities or stocks or bonds or instruments)	22	<u>L3</u>
<u>L2</u>	L1 and (credit with limit or credit near limit)	22	<u>L2</u>
<u>L1</u>	(anonymous or unknown or ghost or alais) near match\$ near system	36	<u>L1</u>

END OF SEARCH HISTORY

Patent Assignment Abstract of Title

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Application #: 09603514

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Publication #: NONE

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Inventors: Gregory D. Mills, Robert Walder

Title: Credit handling in an anonymous trading system

Assignment: 1

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Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

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L5: Entry 16 of 19

File: USPT

Jan 11, 2000

US-PAT-NO: 6014627

DOCUMENT-IDENTIFIER: US 6014627 A

**** See image for Certificate of Correction ****

TITLE: Credit management for electronic brokerage system

DATE-ISSUED: January 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Togher; Michael	New York	NY		
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ASSIGNEE-INFORMATION:

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EBS Dealing Resources, Inc.	New York	NY			02

APPL-NO: 08/ 665594 [PALM]

DATE FILED: June 18, 1996

PARENT-CASE:

CROSS REFERENCE TO RELATED APPLICATIONS This is a continuation of application Ser. No. 08/324,843 filed Oct. 18, 1994, now abandoned, which was a continuation of Ser. No. 07/830,408 filed Feb. 3, 1992 which has issued as U.S. Pat. No. 5,375,055.

INT-CL: [06] G06 F 19/00

US-CL-ISSUED: 705/1; 395/237, 395/238

US-CL-CURRENT: 705/1; 705/37, 705/38

FIELD-OF-SEARCH: 395/237, 395/244, 395/238, 340/825.26, 340/825.27

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>4980826</u>	December 1990	Wagner	
<input type="checkbox"/>	<u>5038284</u>	August 1991	Kramer	
<input type="checkbox"/>	<u>5077665</u>	December 1991	Silverman et al.	

<input type="checkbox"/>	<u>5136501</u>	August 1992	Silverman et al.	
<input type="checkbox"/>	<u>5375055</u>	December 1994	Togher et al.	364/408

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FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
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0 512 702	April 1992	EP	

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ART-UNIT: 274

PRIMARY-EXAMINER: McElheny, Jr.; Donald E.

ATTY-AGENT-FIRM: Fulbright & Jaworski LLP

ABSTRACT:

An anonymous trading system (FIG. 1) identifies the best bids and offers (QuoteSubmit, FIG. 3) from those counterparties (WS Alal) with which each party (WS Alb1, WS Alb2, . . . WSA2a2) is currently eligible to deal, while maintaining the anonymity of the potential counterparty and the confidentiality of any specific credit limitations imposed by the anonymous potential counterparty. To that end, each bid or offer (QuoteSubmit, FIG. 3) for a particular type of financial instrument is prescreened by the system for compatibility with limited credit information (for example, a one bit flag indicating whether a predetermined limit has already been exceeded) and an anonymous "Dealable" price (24,26) is calculated for each of the traders (WS Alb, . . . WS A2a) dealing with that particular financial instrument.

29 Claims, 7 Drawing figures

[Previous Doc](#)

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[Go to Doc#](#)

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15: Entry 16 of 19

File: USPT

Jan 11, 2000

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DOCUMENT-IDENTIFIER: US 6014627 A

**** See image for Certificate of Correction ****

TITLE: Credit management for electronic brokerage system

Abstract Text (1):

An anonymous trading system (FIG. 1) identifies the best bids and offers (QuoteSubmit, FIG. 3) from those counterparties (WS Alal) with which each party (WS Alb1, WS Alb2, . . . WSA2a2) is currently eligible to deal, while maintaining the anonymity of the potential counterparty and the confidentiality of any specific credit limitations imposed by the anonymous potential counterparty. To that end, each bid or offer (QuoteSubmit, FIG. 3) for a particular type of financial instrument is prescreened by the system for compatibility with limited credit information (for example, a one bit flag indicating whether a predetermined limit has already been exceeded) and an anonymous "Dealable" price (24,26) is calculated for each of the traders (WS Alb, . . . WS A2a) dealing with that particular financial instrument.

Brief Summary Text (2):

The present invention relates generally to a electronic brokerage system having a communication network connecting traders dealing in financial instruments, and more particularly to a computerized system for distributing anonymous price quotes on a selective basis in accordance with previously established credit limits.

Brief Summary Text (4):

Reuters' published European patent applications EP 399 850, EP 407 026, and EP 411 748 disclose an automated matching system for anonymous trading of foreign currencies (or other financial instruments) in which a single host computer maintains a central data base consisting of all the trading instruments available for trade, credit information, and the various bids and offers that are present throughout the system. The host computer uses the information in its central data base to match active bids and offers (as well as executing any transitory "hit bid" and "take offer" transactions) based on matching criteria which include the gross counterparty credit limit between counterparties to a potential matching transaction, price, and available quantity. To that end, each client site establishes and may subsequently vary or reset a credit limit for each possible counterparty, which is used by the host computer to establish the gross counterparty credit limit for each possible pair of parties and which is equal to the minimum of the remaining credit (initial credit limit less any applicable transactions that have already been executed) from the first party to the second party and from the second party to the first party. The host computer blocks completion of an otherwise eligible matching transaction between a given pair of potential counterparties when the transaction has an associated value in excess of the applicable gross credit limit. In that system, the various client site computers (keystations) merely maintain and display a restricted subset of the information available at the central computer, such as a predetermined number of the best bids and offers, and communicate credit and other transaction oriented information to the host computer for execution. However, in an attempt to preserve the anonymity of the parties, the client sites do not have access to any credit limits set by their possible counterparties, or even to the identification of any other party to a particular transaction until after a transaction has been

completed.

Brief Summary Text (5):

Thus, in the known prior art system, confidential counterparty credit limit data is maintained in real time and utilized as part of the trade matching process by a central host computer. As a consequence, each client site has no way to determine, prior to committing to buy or sell at a displayed price from one or more anonymous counterparties, whether it is in fact eligible to respond to any of the bids or offers currently being displayed. The client site is connected to the central host computer by telecommunication lines; the host computer is not under the direct control of the party providing the confidential credit limit data and thus provides potential opportunities for unauthorized access to the credit information, even though the host computer does not utilize the credit information until a match has been found between a Buyer and a Seller.

Brief Summary Text (6):

Consequently, unless he attempts to execute a trade at the best price currently displayed on his screen, a trader using the prior art anonymous matching system has no way of knowing whether he has credit with, and is willing to extend credit to, the anonymous counterparty offering (bidding) the best price currently displayed on his screen and thus whether any attempt to buy or sell at the displayed price will be subsequently invalidated by the system for lack of such credit.

Brief Summary Text (9):

To that end, each client site preferably provides the system with only limited credit information for each potential counterparty (for example, a one bit flag indicating whether a predetermined limit has already been exceeded) and each bid or offer for a particular type of financial instrument is preferably prescreened by the system for compatibility with that limited credit information before calculating an anonymous "Dealable" price for presentation to any of the traders dealing with that particular financial instrument.

Brief Summary Text (12):

More particularly, in the preferred embodiment, the sensitive credit limit data indicating how much credit a particular client site is willing to extend to each possible counterparty is maintained only at an access node associated only with that particular client, and only a simple yes/no indication of whether the entity (for example, a trader, a Trading Floor, or a bank) associated with that particular access node is willing to transact business with a particular counterparty is transmitted to the other nodes of the communication network.

Brief Summary Text (13):

To further limit the data received and processed by each of the relevant regional node computers, (ie, the distribution nodes closest to the particular site and/or closest to the particular counterparty), only changes in the credit state between a particular access node and a particular counterparty (ie, credit is no longer available or credit is now available) are transmitted to the distribution nodes, and any credit state information only relevant to transactions between two client sites both associated with other distribution nodes, may be altogether ignored.

Brief Summary Text (19):

When a "buy" or "sell" is made for a quantity in excess of the cumulative applicable credit limits associated with the counterparties having open quotes equal to or better than the displayed price and thus the completed transaction is for a cumulative quantity smaller than desired by the trader, the trader preferably then has the option of "working the balance" (in which the system automatically generates a bid/offer for the difference).

Detailed Description Text (2):

In the described embodiment, the trading system is an electronic brokerage system

having a communication network for facilitating the buying and selling of large blocks of foreign currency by traders each associated with his own Workstation ("WS") located at a Trading Floor of a subscriber bank ("client site"). As shown in FIG. 1, each client site has its dedicated client site computer ("Market Access Node", or "MAN") under the control of a Floor Administrator, which maintains transaction records, credit limits, and other confidential information originating with its associated Trading Floor. The WS's and the MAN associated with each Trading Floor are connected via a conventional self-repairing DEC VAX network to a nearby distribution node ("Market Distributor" or "MD") computer, which typically analyzes and distributes current market data by means of dedicated permanent communication links to one or more associated MAN's in a particular city (or other local region), and which may also provide administrative functions for the communication network. Although not considered critical to the present invention, a group of MD's is preferably supplemented by a common Trading Region processing node ("Arbitrator Node" or "ARB"), with the ARB performing those functions (such as identifying potential matches between Buyers and Sellers, and other aspects of the "Deal Matching" process that require coordination with more than one client site) which make the most efficient use of the communication network if done centrally or regionally, while the MD's perform those functions (such as generation of separate Dealable price information for each individual client site) which are readily implemented in parallel in a distributed processing network and which make most efficient use of the communication if done locally or in close proximity to the individual client sites.

Detailed Description Text (5):

In summary, each MAN is connected to other MAN's by a robust communication network which connects the various Trading Floors and which supplements the MAN's with a number of processing nodes (preferably in the form of MD's and ARB's) to facilitate the distribution of price quotations and other market data and to execute transactions by matching eligible Market Makers with eligible Buyers and Sellers and by monitoring the transactions until they have been completed or aborted, with the MAN's being responsible for Trading Floor specific tasks such as logging the completed transaction and updating the credit limit that was previously available to the counterparty Trading Floor.

Detailed Description Text (6):

The structure and function of the trader WS's, MAN's, MD's, and ARB's will now be described in detail, with particular emphasis on how they cooperate to distribute price quotes (bids and offers) from a Market Maker to potential Takers throughout the system. In the prior art, such quotes were made available to the individual traders merely in the form of one or more public best prices for each currency pair (or other financial instrument type) then being offered by any Market Maker, without regard for any confidential credit restrictions imposed by the Maker or by the potential Taker that may prevent any deal being consummated. However, in accordance with the present invention, each trader receives a private Dealable price, which the system has prescreened for the absence of any credit restrictions that would prevent the trader on whose WS the Dealable price is displayed from dealing with an anonymous Market Maker from whom the displayed price originates.

Detailed Description Text (20):

As noted previously, the trading is performed electronically, and when a bid price is equal to or greater than an offer price, the two will normally be automatically matched, with the system automatically allocating any price difference between the two trader's in accordance with previously agreed trading rules. Thus it is not likely that a displayed bid price 18,24 will be greater than a displayed offer price 20,26. However, if two traders are barred from dealing with each other because of credit limit restrictions but are both free to deal with a third trader, it is still possible that the third trader will be presented with an arbitrage opportunity.

Detailed Description Text (26):

As shown in FIG. 4, each trader can call up a "Trader Profile" screen 70 to select his current trading currency 72, and also to establish or modify his personal default values for normal and maximum trading size 74, 76 and price time limit 78, and his preferences regarding optional automated trading protocols 78, such as canceling a quoted price that has been partially dealt (only a portion of the available size was matched with a qualified counterparty) or bettered (is not equal to the Best Dealable price for that size that is currently available to any potential counterparty with whom bilateral credit still exists). As noted previously, the trader may also elect to display the Regular 80 or Best 82 Dealable price, and the system also provides the trader with various options 82 for automatically "working the balance" in the event the trader attempts to buy or sell a particular quantity at the displayed Dealable price but misses the deal in whole ("complete") or in part ("partial"). Depending upon the particular option selected, the system automatically generates and transmits a bid at the last Dealable offer price if the trader was not able to buy the full quantity desired, for a quantity equal to the difference between the desired quantity and the quantity actually traded.

Detailed Description Text (27):

In addition, a Floor Administrator (preferably for internal security reasons a bank employee free of any trading responsibilities) has his own WS with a Floor Profile screen (not shown) which includes an option to prevent his own traders from trading with each other, and a maximum Business Day Credit Limit for each eligible counterparty which represents the maximum cumulative value of trades that may be executed by all traders of the Trading Floor with the designated counterparty. Alternately, the system could combine transactions from related Trading Floors, in which case the Floor Profile could merely identify a common credit facility having a single credit limit for each Trading Floor or groups of Trading Floors. The Floor Administrator also selects a warning percentage which the system uses to broadcast a warning message to the Administrator and all the traders on a given Floor that a particular counterparty has utilized a specified percentage of its available credit, in which case the traders may wish to alter their trading strategies and/or the Floor Administrator may choose to raise the applicable credit limit.

Current US Class (1):

705

Other Reference Publication (5):

Campbell, Carl M. Jr., A Microprocessor-Based Module to Provide Security in Electronic Funds Transfer Systems, IEEE Compcon, Fall of 1979.

Other Reference Publication (9):

Sammer, Harald W. Online Stock Trading Systems: Study of an Application, IEEE Compcon, Spring of 1987.

Other Reference Publication (12):

Finebaum, M., Information Systems in the Securities Industry, 21st Annual Hawaii Int. Conf. on System Sciences, 1988, vol. 4.

Other Reference Publication (49):

Arend, M., New Systems Lighten Load on Bank Securities Wings . . . , Wall Street Computer Review, Nov. 1990.

Other Reference Publication (54):

Proposed Rulemaking, Proprietary Trading Systems Securities and Exchange Commission, Apr. 11, 1989.

Other Reference Publication (55):

Letter from Robert A. McTamaney, Esq., Re: RMJ Securities Jan. 12, 1989.

Other Reference Publication (61):

Letter from M. Pierre Fleuriot, Re: Distributions of Certain French Securities, Jun. 7, 1994.

Other Reference Publication (62):

Securities and Exchange Commission, Action: Policy Statement, Nov. 16, 1989.

CLAIMS:

1. A computerized trading system for trading of financial instruments between traders trading at a plurality of trading floors, said system comprising

a communication network for transmitting electronic messages,

a plurality of trader terminals each associated with a respective one of said trading floors and connected to the communication network, for generating electronic price quotation messages including bid and/or offer prices, and

communicating selected bid and offer price information based on price quotation messages originating from other said trading floors and received over the communication network,

credit limit administration processing means connected to the communication network, for automatically determining whether a predetermined level of credit is currently respectively available from each trading floor to each of the other trading floors, and

deable price distribution processing means connected to said communication network and responsive to said price quotation messages as well as to said credit limit administration means for automatically transmitting dealable price messages to the terminals of at least one particular trading floor, said dealable price messages being derived only from price quotation messages from those trading floors for which said credit administration means has determined said predetermined level of credit is currently available on a bilateral basis both from and to said particular trading floor.

10. The trading system of claim 1, further comprising

a plurality of access nodes connected to the communication network, including a first access node associated only with a first trading floor and a second access node associated only with a second trading floor, for maintaining a record of all trades executed on behalf of an associated trading floor, and

one or more distribution nodes connected to the communication network, wherein

said access nodes collectively comprise said credit authorization processing means,

said distribution nodes collectively comprise said dealable price distribution processing means,

said access nodes transmit over the communication network to said distribution nodes credit update messages which indicate whether said predetermined level of credit is currently available on a unilateral basis from one trading floor to another trading floor without indicating the extent of any credit currently remaining above said predetermined level,

said dealable price distribution processing means maintains at each of said distribution nodes an ordered list of at least those of said price quotation

messages which are not yet withdrawn or reserved and a preauthorization matrix whose individual entries collectively indicate whether or not said predetermined level of credit is available on a bilateral basis between each of its respective trading floors and each of said plurality of trading floors,

said dealable price information is transmitted from each said distribution node to one or more of said access nodes for eventual transmission to associated ones of said terminals

each said access node is located on the premises of a respective trading floor and contains only credit information originating with said respective trading floor,

said credit limit administration processing means transmits an electronic credit update message to said distribution nodes whenever a predetermined minimum level of credit becomes available or is no longer available to a particular said trading floor, and said credit update message does not specify the amount of credit available.

14. The trading system of claim 10, wherein said current credit limit is derived from a predetermined maximum trade volume and the actual cumulative trade volume between said associated trading floor and one other trading floor dealing in a plurality of types of financial instruments.

15. The trading system of claim 14, wherein said current credit limit is a combined limit applicable to a plurality of related trading floors.

17. A computerized trading method for trading of financial instruments between traders trading at respective trading floors, said method comprising

generating electronic price quotation messages including bid and/or offer prices for a particular financial instrument from one or more of the trading floors,

automatically administering credit on a unilateral basis from each of the trading floors to the other trading floors,

automatically deriving a respective dealable price message for said particular financial instrument only from price quotation messages from those other trading floors for which bilateral credit currently remains both from and to a particular trading floor, and

automatically communicating said dealable price message on an anonymous basis to a trader at said particular trading floor without disclosing the origin of the price quotation messages from which the dealable price message was derived.

25. The computerized trading method of claim 17, wherein

said unilateral credit is maintained at an access node of said network in the form of a confidential credit data base containing an initial unilateral credit limit and any remaining unilateral credit currently available from the particular trading floor to the other trading floor,

said credit data base is accessible only by said particular trading floor,

said access node is located on the premises of said particular trading floor and does not contain credit data originating from any other trading floor,

bilateral credit is considered as currently existing between any two trading floors if at least a predetermined level of remaining unilateral credit is currently available from each of the two trading floors to the other trading floor,

the dealable price message is generated at a distribution node of said network that is remote from said access node and that does not have access to any data reflecting any remaining unilateral credit in excess of said predetermined level,

said access node transmits an electronic credit update message to said distribution node whenever said predetermined minimum level of unilateral credit becomes available or becomes unavailable from the particular trading floor to the other trading floor.

28. The computerized trading method of claim 25, wherein said remaining unilateral credit from a first trading floor to a second trading floor is derived from a predetermined initial credit limit extended from said first trading floor to said second trading floor and the actual cumulative trade volume between said first and second trading floors for a plurality of types of financial instruments including but not limited to said particular financial instrument.

29. The computerized trading method of claim 25, wherein said remaining unilateral credit is established on behalf of a plurality of related trading floors constituting a common credit facility and is derived from a predetermined initial credit limit extended from the common credit facility to a particular group of trading floors.

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

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15: Entry 17 of 19

File: USPT

Mar 10, 1998

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DOCUMENT-IDENTIFIER: US 5727165 A

TITLE: Offer matching system having timed match acknowledgment

DATE-ISSUED: March 10, 1998

INVENTOR-INFORMATION:

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APPL-NO: 08/ 364009 [\[PALM\]](#)

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PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS This applications is a continuation of application Ser. No. 07/788,575, filed Nov. 6, 1991, now abandoned.

FOREIGN-APPL-PRIORITY-DATA:

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GB	9027249	December 17, 1990
GB	9104121	February 27, 1991
GB	91306146	July 5, 1991

INT-CL: [06] [G06](#) [F](#) [17/60](#)

US-CL-ISSUED: 395/237

US-CL-CURRENT: [705/37](#)

FIELD-OF-SEARCH: 395/237

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

[Search Selected](#)[Search ALL](#)[Clear](#)

PAT-NO

ISSUE-DATE

PATENTEE-NAME

US-CL

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ART-UNIT: 241

PRIMARY-EXAMINER: Hayes; Gail O.

ASSISTANT-EXAMINER: Yount; Steven R.

ABSTRACT:

An improved matching system for trading instruments in which the occurrence of automatically confirmed trades is dependent on receipt of match acknowledgement messages by the host computer (200) from all counterparties (KS A, KS B) to the matching trade. The host computer (200) matches like bids and offers provided thereto by the various keystations (KS A, KS B) in accordance with a predetermined matching criteria. Each of the keystations (KS A, KS B) includes a trade status timer (300, 302) and a display (310, 312) for timing receipt of a confirmed trade and/or ticket generation message from the host (200) after the keystation (KS A, KS B) has sent a match acknowledgement message and for displaying an "unconfirmed trade" status message awaiting receipt of the "confirmed trade" indication from the host (200). An alarm and a display message is provided at the keystation (KS A, KS B) when the "confirmed trade" indication is not timely received. The host (200) receives match acknowledgement messages from all of the counterparties (KS A, KS B) to the match before confirming a trade. A ticket is not generated at the keystation (KS A, KS B) until the trade has been confirmed by the host (200).

48 Claims, 8 Drawing figures

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

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L5: Entry 17 of 19

File: USPT

Mar 10, 1998

DOCUMENT-IDENTIFIER: US 5727165 A

TITLE: Offer matching system having timed match acknowledgment

Abstract Text (1):

An improved matching system for trading instruments in which the occurrence of automatically confirmed trades is dependent on receipt of match acknowledgement messages by the host computer (200) from all counterparties (KS A, KS B) to the matching trade. The host computer (200) matches like bids and offers provided thereto by the various keystations (KS A, KS B) in accordance with a predetermined matching criteria. Each of the keystations (KS A, KS B) includes a trade status timer (300, 302) and a display (310, 312) for timing receipt of a confirmed trade and/or ticket generation message from the host (200) after the keystation (KS A, KS B) has sent a match acknowledgement message and for displaying an "unconfirmed trade" status message awaiting receipt of the "confirmed trade" indication from the host (200). An alarm and a display message is provided at the keystation (KS A, KS B) when the "confirmed trade" indication is not timely received. The host (200) receives match acknowledgement messages from all of the counterparties (KS A, KS B) to the match before confirming a trade. A ticket is not generated at the keystation (KS A, KS B) until the trade has been confirmed by the host (200).

Brief Summary Text (1):

This application is related to the commonly owned U.S. patent applications entitled "Distributed Matching System," filed May 25, 1989, bearing U.S. Ser. No. 357,036, now U.S. Pat. No. 5,077,665; issued Dec. 13, 1991; "Distributed Matching System Method," filed May 25, 1989, bearing U.S. Ser. No. 357,484; "Anonymous Matching System," filed May 26, 1989, bearing U.S. Ser. No. 357,478, now U.S. Pat. No. 5,136,501, issued Aug. 4, 1992; "Integrated Trading System," filed Nov. 22, 1989, bearing U.S. Ser. No. 440,971; and "Integrated Trading System Method," filed Nov. 22, 1989, bearing U.S. Ser. No. 441,156; and U.S. Pat. No. 5,003,473, issued Mar. 26, 1991 and entitled "Trading Ticket Output System," the contents of all of which are specifically incorporated by reference herein in their entirety, and is an improvement thereon.

Brief Summary Text (3):

The present invention relates to matching systems for effectuating trades of trading instruments through automatic matching in which buyers and sellers who are willing to trade with one another based on specified criteria may automatically trade when matching events occur satisfying these criteria, and more particularly to improvements in such matching systems in which risks are minimized as to losses due to broken trades.

Brief Summary Text (5):

Information retrieval systems for financial information, such as stock market type of information and money market information, normally employ a transfer of data in a high-performance, real-time information retrieval network in which update rates, retrieval rates and subscriber and/or user population are generally very high. An example of such a system is assignee's REUTER MONITOR DEALING SERVICE which is used in the foreign exchange or money market. Such systems, while providing rapid video conversation capability, and the ability, in the instance of Reuters' MONITOR DEALING SERVICE, to display a message when a connection is lost during a negotiated

trade, are not anonymous systems nor do they provide for automated anonymous trading such as is possible in a matching system. Of course, conversational dealing systems have their place in the market and serve particular needs where appropriate. However, anonymous matching systems are also often desired and, by their very nature, do not normally employ a conversation capability since the parties to the transactions are unknown until the transaction has been completed. Examples of satisfactory prior art video conversational systems for use in connection with trading of financial information are disclosed in commonly owned U.S. Pat. Nos. 4,531,184; 4,525,779 and 4,404,551, by way of example. In this regard, U.S. Pat. No. 4,525,779 discloses a feature termed a DEAL KEY for providing a visual confirmation signal during a negotiated trade but does not concern itself with the problems of anonymous matching trades and the types of confirmations required therein to complete a deal in which risks are minimized as to losses due to broken trades.

Brief Summary Text (6):

Prior art examples of matching systems used in connection with the trading of trading instruments are disclosed in U.S. Pat. No. 4,412,287, and U.K. Patent Nos. 1,489,571 and 1,489,573, all of which disclose automatic stock exchanges in which a computer matches buy and sell orders for a variety of stocks; U.S. Pat. No. 3,573,747, which discloses an anonymous trading system for selling fungible properties between subscribers to the system; U.S. Pat. No. 3,581,072, which discloses the use of a special purpose digital computer for matching orders and establishing market prices in an auction market for fungible goods; U.S. Pat. No. 4,674,044, which discloses an automatic securities trading system; and U.S. Pat. No. 4,903,201, which discloses an automated computerized, open outcry exchange system for trading commodity contracts through automatic matching. Other such prior art matching systems are SOFFEX, such as described in the Feb. 15, 1988 issue of Asian Finance at pages 22-23 TAFEX; such as described in the May 1976 issue of Institutional Investor at pages 32-36; and VSE's MATCHMAKER, described in the Aug. 4, 1988 issue of Competing Canada, at pages 12, 42. However, none of these prior art matching systems implements or suggests the use of risk controls to minimize risks as to losses due to broken trades, which are situations in which you are not entirely sure which trades have been completed or not due to a failure somewhere in the system, such as a network failure, a control system or host failure, or a keystation failure, all of which could result in one party thinking a trade or match had occurred while the counterparty was completely unaware of the trade. Applicants' assignee has recently overcome some of these problems in matching systems which it has introduced under the names of GLOBEX, such as described in the Feb. 13, 1989 issue of the New York Times at pages D1, D6, and REUTER DEALING 2000 Automatic FX Matching network. However, these systems have involved a transaction desk in which trades had to be "voted upon" automatically at a site remote to the host computer and to the individual keystations before ultimately becoming completed trades. Such an arrangement lacks many of the advantages of the invention herein, particularly in the type of dynamic environment in which such matching systems are normally employed. Moreover, no prior art distributed anonymous matching systems are known to applicants in which broken trade alerts are timely provided when a system failure occurs after a match which prevents immediate notification to all counterparties of confirmation of the trade. Furthermore, no such prior art matching systems are known to applicants in which the timing of responses to positive match acknowledgements are utilized by the keystations attempting to avoid broken trades. This is so despite the well known monitoring of computer signals to detect communication faults, such as disclosed in U.S. Pat. Nos. 3,745,800; 4,276,593; 4,625,276; 4,789,928; and 4,713,811.

Brief Summary Text (7):

Nevertheless, in anonymous matching systems, such as described in U.S. patent application Ser. No. 357,478, filed May 26, 1989, now U.S. Pat. No. 5,136,501, issued Aug. 4, 1992 and incorporated by reference herein, there can be a problem when one communication channel fails during the matching transaction. It may occur

that although confirmation is sent to one keystation or counterparty and acknowledged, the other counterparty to the matching transaction which occurred at the host does not receive details of the contract and/or his acknowledgement does not reach the host computer or central system. If the communication channel which fails is that of the purchaser and failure occurs after he has made his offer to buy but before he receives an acceptance, the seller will have offered to sell, will have received details of the contract from the host or central system and will have acknowledged receipt of the host or central system so that as far as the seller is concerned, the contract or deal is complete. The buyer will have received details of the offer from the host or central system and have made his acceptance or an alternative offer to buy but due to the channel failure he will not have received any details of the contract. He will be uncertain of his position and may assume that his acceptance was too late or his offer to buy has not been accepted and consider the deal or contract not made. This will leave the host or central system and the buyer at odds, and if the terms of business are appropriate, it may be that the host or central system has to purchase the items from the seller and attempt to sell them in the market itself, possibly at a loss, if the buyer has considered the contract not made.

Brief Summary Text (12):

An improved matching system for trading instruments in which the occurrence of automatically confirmed trades is dependent on match acknowledgement from all counterparties to the matching trade. In the system of the present invention, bids for the trading instruments which may be any type of trading instrument such as foreign exchange, stocks, bonds, commodities future contracts, etc., are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to provide confirmed trades for the given trading instruments. The system comprises a host computer or central station for matching like bids and offers provided thereto in accordance with a predetermined matching criteria, a transaction originating keystation or client for providing a bid on a given trading instrument to the system for providing a potential matching transaction, a counterparty keystation or client for providing an offer on the given trading instrument involved in the potential matching transaction, and a network or communications link for interconnecting the host computer, the transaction originating keystation, and the counterparty keystation in the system for enabling data communications therebetween. The host computer comprises match notification data message generation means for providing a match notification data message to the transaction originating keystation and the counterparty keystation via the network in response to the occurrence of a matching transaction at the host computer, which is the central location at which matches automatically take place in accordance with the predetermined matching criteria, such as described in the aforementioned U.S. patent application Ser. No. 357,478, now U.S. Pat. No. 5,136,501, issued Aug. 4, 1992. The match notification data message comprises an unconfirmed matching transaction for the given trading instrument, which is an indication that a match has occurred but that the deal has not been confirmed or completed since all counterparties to the deal have not yet been notified. Match acknowledgement data message generation means are located at each of the keystations for respectively providing a match acknowledgement data message to the host computer via the network in response to receipt of the match notification data message by the transaction originating keystation means and the counterparty keystation, respectively, so that confirmation of the trade, and ultimate ticket generation, can occur. The host computer further comprises confirmed trade data message generation means for providing a confirmed trade data message to the transaction originating keystation and the counterparty keystation via the network in response to receipt of the match acknowledgement data messages from both the transaction originating keystation and the counterparty keystation. The transaction originating keystation and the counterparty keystation each further comprise trade status timing means for timing receipt of the confirmed trade data message by the respective keystation for providing a trade status display at the respective keystation based on the timed receipt of the confirmed trade data

message. The trade status timing arrangement is such that an alarm condition is provided to the keystation when the confirmed trade data message is not received within a predetermined time interval, a confirmed trade status display is provided at the keystation if this message is received within this timed interval, and a late confirmed trade status display is provided if this message is received after this timed interval. During this time interval, until a confirmed trade occurs, an unconfirmed trade status display is provided. The host computer may also employ a timing arrangement for timing receipt of the match acknowledgement data messages from the keystations in order to provide an alarm condition to the respective keystation if a match acknowledgement data message has not been timely received from the other party to the trade.

Detailed Description Text (2):

Referring now to the drawings in detail, and initially to FIGS. 1 and 8, the improved matching system of the present invention is shown in diagrammatic form. In this regard, the system of the present invention is generically illustrated in FIG. 1 and is further illustrated, by way of example, in FIG. 8, as an improvement over the anonymous matching system described in U.S. patent application Ser. No. 357,478, now U.S. Pat. No. 5,136,501, issued Aug. 4, 1992, the contents of which are specifically incorporated by reference herein in their entirety. In the message diagram of FIG. 1, various messages are shown as being transmitted between stations in a typical transaction, with the other stations in the network having been omitted for purposes of clarity. Each station can be considered to have a signal terminal S and a message terminal T for each message. For a transmitted message, the operator of the station conventionally causes a signal to be applied to the signal terminal and this causes the message to be conventionally transmitted from T. For a received message, the message is conventionally applied to T and this causes a command signal to be conventionally generated at a separate terminals and message lines are shown for each message, but in practice a single communication channel between the host and a client or keystation will suffice, and separate terminals for each message may not be necessary since the station will, in practice, conventionally receive a message and detect which type of message it is and generate appropriate command signals and apply them to appropriate devices at that station. For ease of understanding, it is convenient to illustrate the system with a plurality of message lines and terminals, even though they may not be separately present in practice.

Detailed Description Text (3):

The connection and operation of the system will generically be described with reference to the situation in which client A (KS A) makes an offer to sell one million of a given trading instrument at a given price and this offer is transmitted as message 1 to the central system known as the host computer 200. This offer is anonymously broadcast as message 2 to all clients or keystations, including client A (KS A) who made the offer and client B (KS B), by the host computer 200. If client B does not wish to buy the full one million of the given trading instrument but makes a counter offer as message 3 to buy one hundred thousand of the trading instrument at that price, the host computer sends a message 4 to client A (KS A) that he has sold one hundred thousand of the trading instrument to client B at the offered price and it sends message 6 to client B (KS B) that he has bought that amount.

Detailed Description Text (8):

At the host computer 200, if desired, an optional checking system may be provided. In such an instance, the receipt of a message 3 from client B (KS B) offering to buy certain trading instruments at the offered price will prompt a command signal on terminal S3 to operate a timer and also send match notification signals 4 and 6 to the respective clients or keystations via terminals S4, T4, S6 and T6. This is shown by connections in FIG. 1 and, by way of example, is illustrated by the message flow chart of FIG. 5. The match acknowledgement signals 5 and 7 which are received back from the client keystations prompts corresponding command signals at

terminals S5 and S7 which will be passed to the match notification store. If the trade has not yet been acknowledged by either party, the first signal preferably causes the store to change to the state of having been acknowledged by one party. If it is already in that state, the receipt of the signal will preferably have three functions; namely, to stop and cancel the timer, to declare the match as fully acknowledged at the host computer 200 and to send confirmation messages 8 and 9 to the respective client keystations via terminals S8, T8, S9 and T9 of a "confirmed trade." This is shown by way of example, in the connections of FIG. 1 and the message flow chart of FIG. 6.

Detailed Description Text (12):

Referring now to FIG. 8, the improved matching system of the present invention shall be described in further detail as a specific improvement on the anonymous matching system described in U.S. patent application Ser. No. 357,478, now U.S. Pat. No. 5,136,501, issued Aug. 4, 1992, the contents of which has been specifically incorporated by reference herein in their entirety. As shown and preferred in FIG. 8, the transaction desk or T-desk utilized in the anonymous trading system of the above application for risk management has been eliminated and replaced by the improved system of the present invention in which timers 300, 302 are located, by way of example, at the individual client keystations KS A, KS B, respectively, for timing receipt of the "confirmed trade" message and/or ticket generation message from the host 200 in order to generate an alarm condition and display trade status on displays 202, 204, respectively, when the "confirmed trade" message is not timely received within a predetermined period, such as the 15 second time period given by way of example in the discussion of FIG. 1, as well as an unconfirmed trade "status message pending confirmation," or a "late confirmed trade" status message for trades confirmed after this predetermined time period. In addition, the system of FIG. 8 includes the provision of the optional timer 304 at the central host 200 for timing receipt of match acknowledgement signals from the respective keystations KS A, KS B within a predetermined period, such as the 60 second time period given by way of example in the above discussion of FIG. 1. Preferably, in the improved matching system illustrated in FIG. 8, a trading ticket is not released by the host 200 until the host 200 has received the match acknowledgement messages or MATCH-ACK for that match or trade from the counterparties to the trade which, in the example of FIGS. 1 and 8, are keystations KS A and KS B. As shown and preferred in the example of FIG. 8, keystation A or KS A is considered the transaction originating keystation which, in this example, submits a transaction called "bid" to the central host 200, which bid is sent as a "bid notification" anonymously to all keystations in the system at this point and as a "bid acknowledgment" to KS A. Assuming keystation B or KS B has submitted an offer at that price to the central host 200, the central host will recognize that a match is now possible and, assuming that the predetermined matching criteria have been met, such as quantity and gross counterparty credit limit, by way of example, the host 200 will then create a match which is not yet confirmed by the counterparties to the trade and will transmit a "match notification" message to the counterparties involved in the match, such as KS A and KS B in the above example. Upon receipt of the match notification message from the host 200, the respective keystation KS A and/or KS B automatically transmits a match acknowledgement message or MATCH-ACK back to the host 200 and the respective timer, 300, 302, respectively starts timing the elapsed time between transmission of the MATCH-ACK message and receipt back of a "confirmed trade" and/or ticket generation message from the host 200 which should occur within the previously set predetermined time period, such as the 15 seconds given in the above example. Preferably, assuming the host 200 receives the MATCH-ACK messages from all counterparties to the trade, KS A and KS B, it will automatically transmit both "the confirmed trade" message and a ticket generation message to the counterparties which will cause the display 202, 204 to display a "confirmed trade" or a "done" message next to the particular transaction, as well as printing of the corresponding trade ticket by the associated conventional trade ticket printer 306, 308. If, however, the "confirmed trade" and/or ticket generation message is not timely received by the particular

counterparty, keystation KS A or KS B in this example, within this predetermined period, then preferably a warning message is displayed on the appropriate display 202, 204 and, if desired, an audible alarm may be sounded at the conventional keyboard 310, 312 used to input data at the respective keystation KS A, KS B, respectively. However, preferably, if the "confirmed trade" message and/or ticket generation message is subsequently received by the keystation KS A or KS B after this predetermined period, such as due to a delay in transmission somewhere in the system, then the trade status message display at the keystation will subsequently display a "late confirmed trade" message, although the warning will have first sounded and/or been displayed at the end of the predetermined interval. Since the timers 300, 302 basically also control the trade status display on the keystation displays 202, 204 in response to changes in the trade status over time, these timers 300, 302 are in effect trade status timers.

Current US Class (1):

705

CLAIMS:

1. In a matching system for trading instruments in which bids for said trading instruments are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to provide confirmed trades for said given trading instruments, said system comprising a host computer means for matching like bids and offers provided thereto in accordance with a predetermined matching criteria, a transaction originating keystation means for providing a bid on a given trading instrument to said system for providing a potential matching transaction, a counterparty keystation means for providing an offer on said given trading instrument involved in said potential matching transaction, and network means for interconnecting said host computer means, said transaction originating keystation means, and said counterparty keystation means in said system for enabling data communications therebetween;

said host computer means comprising match notification data message generation means for providing a match notification data message to said transaction originating keystation means and said counterparty keystation means via said network means in response to the occurrence of a matching transaction at said host computer means, said match notification data message comprising an unconfirmed matching transaction for said given trading instrument;

and match acknowledgement data message generation means disposed at each of said keystation means for respectively providing a match acknowledgement data message to said host computer means via said network means in response to receipt of said match notification data message by said transaction originating keystation means and said counterparty keystation means, respectively;

said host computer means further comprising confirmed trade data message generation means for providing a confirmed trade data message to said transaction originating keystation means and said counterparty keystation means via said network means in response to receipt of said match acknowledgement data messages from both said transaction originating keystation means and said counterparty keystation means;

said transaction originating keystation means and said counterparty keystation means each further comprising trade status timing means for timing a duration between transmission of said match acknowledgment data message and an expected receipt of said confirmed trade data message by said respective keystation means for providing a trade status display at said respective keystation means based on said timed receipt of said confirmed trade data message;

whereby the occurrence of automatically confirmed trades is dependent on match acknowledgement from all counterparties to the matching trade.

7. An improved matching system in accordance with claim 6 wherein said trading instruments comprise financial trading instruments.

14. An improved matching system in accordance with claim 1 wherein said trading instruments comprise financial trading instruments.

36. In a matching system for trading instruments in which bids for said trading instruments are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to provide confirmed trades for said given trading instruments, said system comprising a host computer means for matching like bids and offers provided thereto in accordance with a predetermined matching criteria, a transaction originating keystation means for providing a bid on a given trading instrument to said system for providing a potential matching transaction, a counterparty keystation means for providing an offer on said given trading instrument involved in said potential matching transaction, and network means for interconnecting said host computer means, said transaction originating keystation means, and said counterparty keystation means in said system for enabling data communications therebetween;

said host computer means comprising match notification data message generation means for providing a match notification data message to said transaction originating keystation means and said counterparty keystation means via said network means in response to the occurrence of a matching transaction at said host computer means, said match notification data message comprising an unconfirmed matching transaction for said given trading instrument;

and match acknowledgement data message generation means disposed at each of said keystation means for respectively providing a match acknowledgement data message to said host computer means via said network means in response to receipt of said match notification data message by said transaction originating keystation means and said counterparty keystation means, respectively;

said host computer means further comprising confirmed trade data message generation means for providing a confirmed trade data message to said transaction originating keystation means and said counterparty keystation means via said network means in response to receipt of said match acknowledgement data messages from both said transaction originating keystation means and said counterparty keystation means;

said transaction originating keystation means and said counterparty keystation means each further comprising trade status timing means for timing a duration between receipt of said match notification data message and an expected receipt of said confirmed trade data message by said respective keystation means for providing a trade status display at said respective keystation means based on said timed receipt of said confirmed trade data message;

whereby the occurrence of automatically confirmed trades is dependent on match acknowledgement from all counterparties to the matching trade.

38. A keystation for use with a system incorporating a host computer for determining matches of offers and bids between keystations for given trading instruments according to predetermined matching criteria, said host computer communicating with said keystations via a network and sending to said keystations both match notification signals in response to the occurrence of a match determined by said host computer, and trade confirmation signals in response to receipt of acknowledgement signals from said keystations indicating receipt of the match notification signals, said keystation comprising:

receiving means for receiving at least said match notification signals and said trade confirmation signals from said host computer;

output means for providing signals generated by said keystation to at least said host computer; and

timing means for timing a duration from the receipt of said match notification signals to an expected receipt of said trade confirmation signals.

40. A keystation for use with a system incorporating a host computer for determining matches of offers and bids between keystations for given trading instruments according to predetermined matching criteria, said host computer communicating with said keystations via a network and sending to said keystations both match notification signals in response to the occurrence of a match determined by said host computer, and trade confirmation signals in response to receipt of acknowledgement signals from said keystations indicating receipt of the match notification signals, said keystation comprising:

receiving means for receiving at least said match notification signals and said trade confirmation signals from said host computer;

output means for providing signals generated by said keystation to at least said host computer;

timing means for timing a duration from providing of said match acknowledgement signals to said host computer and an expected receipt of said trade confirmation signals by said keystation.

42. In a matching system for trading instruments, wherein a host computer matches like bids and offers provided thereto from at least two keystations, said host computer and said keystations being connected via a network; means for preventing the occurrence of broken trades comprising:

notification means in said host computer for notifying said at least two keystations of a match;

acknowledgement means in said keystations for respectively acknowledging to said host computer the notification received from said notification means;

confirmation means in said host computer for confirming to said keystations the acknowledgment received from said keystations;

wherein each of said keystations monitors a duration between an expected receipt time of confirmation received by said keystations and at least one of said notification received by said keystations and said acknowledgement by said keystations.

43. A matching system for trading instruments comprising:

host computer means for matching like bids and offers provided thereto;

a plurality of client keystation means each comprising first timing means, at least a first one of said client keystation means being a transaction originating client keystation means for providing a bid to said host computer means, and at least a second one of said client keystation means being a counterparty keystation means for providing an offer to said host computer means;

network means for providing communication between said host computer means and said plurality of client keystation means;

said host computer means generating a match notification message and transmitting said match notification message via said network means to said transaction

originating client keystation means and said counterparty keystation means upon determining the occurrence of a match;

said transaction originating client keystation means and said counterparty keystation means each generating and transmitting a match acknowledgment message to said host computer means via said network means upon receipt of said match notification message;

said host computer means further generating and transmitting a confirmed trade message via said network means in response to receipt of said match acknowledgement message from each of said transaction originating client keystation means and said counterparty keystation;

wherein said first timing means in each of said keystation means measures a duration of time between at least one of said received match notification message and said transmitted match acknowledgement message, and an expected time for receiving said confirmed trade message.

46. In a matching system for matching trading instruments in which bids for said trading instruments are automatically matched against offers for said trading instruments supplied by client keystations, said system for automatically providing matching transactions in order to provide confirmed trades for said trading instruments, wherein a host computer matches said offers and bids for said trading instruments according to predetermined matching criteria, said host computer communicating with said client keystations via a network, timing means in said client keystations for timing a duration between a first signal sent to said client keystations from said host computer to indicate the existence of a match and an expected receipt time of a second signal sent by said host computer to said client keystations to verify a confirmed trade.

47. In a matching system for matching trading instruments in which bids for said trading instruments are automatically matched against offers for said trading instruments supplied by client keystations, said system for automatically providing matching transactions in order to provide confirmed trades for said trading instruments, wherein a host computer matches said offers and bids for said trading instruments according to predetermined matching criteria, said host computer communicating with said keystations via a network, timing means in said client keystations for timing a predetermined duration between a first signal sent by said client keystations to said host computer to indicate acknowledgement of a match and an expected receipt time of a second signal sent by said host computer to said client keystations to verify a confirmed trade.

48. A matching system for trading instruments in which bids for said trading instruments are automatically matched against offers for given trading instruments, said matching system comprising:

a host computer for automatically matching like bids and offers provided thereto in accordance with predetermined matching criteria;

a first transaction terminal for providing a bid on a given trading instrument to said host computer;

a second transaction terminal for providing an offer on said given trading instrument to said host computer; and a network for interconnecting said host computer, said first transaction terminal, and said second transaction terminal for enabling data communications therebetween, wherein

said host computer transmits an unconfirmed match notification message to said first transaction terminal and said second transaction terminal via said network if the bid and the offer for the given trading instrument satisfy the predetermined

matching criteria,

said first and second transaction terminals each transmit a match confirmation data message to said host computer via said network in response to reception of the unconfirmed match notification data message,

said host computer further transmits a confirmed trade data message to said first and second transaction terminals via said network means in response to reception of said match confirmation data messages from both of said first and second transaction terminals, and

said first and second transaction terminals each comprise a trade status displaying means for displaying a trade confirmed indication if said confirmed trade data message is received within a predetermined time and for displaying a trade not confirmed indication if said confirmed trade data message is not received within said predetermined time.

[Previous Doc](#)

[Next Doc](#)

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L5: Entry 19 of 19

File: USPT

Aug 4, 1992

US-PAT-NO: 5136501

DOCUMENT-IDENTIFIER: US 5136501 A

**** See image for Certificate of Correction ****TITLE: Anonymous matching system

DATE-ISSUED: August 4, 1992

INVENTOR-INFORMATION:

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DATE FILED: May 26, 1989

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US-CL-CURRENT: 705/37; 705/38

FIELD-OF-SEARCH: 364/401, 364/408

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>3573747</u>	April 1971	Adams et al.	364/408
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<input type="checkbox"/>	<u>4677552</u>	June 1987	Sibley, Jr.	364/408
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<input type="checkbox"/>	<u>4774663</u>	September 1988	Musamanno et al.	364/408
<input type="checkbox"/>	<u>4903201</u>	February 1990	Wagner	364/900

OTHER PUBLICATIONS

Welles, Institutional Investor "The Computer Assault on New York's Foreign Exchange Market"; May 1976, 32.

ART-UNIT: 231

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ABSTRACT:

A matching system for trading instruments in which bids are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to complete trades for the given trading instruments, includes a host computer means (20) comprising means for anonymously matching active bids and offers in the system by trading instrument based on a variable matching criteria, which comprises counterparty credit limit between counterparties (24a, 26b) to a potential matching transaction. The system also includes a transaction originating keystation (24a) for providing a bid on a given trading instrument to the system for providing the potential matching transaction; a counterparty keystation (26b) for providing an offer on the given trading instrument involved in the potential matching transaction; and network means (22) for interconnecting the host computer means (20), the transaction originating keystation (24a) and the counterparty keystation (26b) in the system for enabling data communications therebetween. Both the transaction originating keystation (24a) and the counterparty keystation (26b) for the potential matching transaction each have an associated counterparty credit limit, with the system (20) blocking completion of the potential matching transaction between the transaction originating keystation (24a) and the counterparty keystation means (26b) when the potential matching transaction has an associated value in excess of counterparty credit limit. The assigned credit limits may be reset or varied by the users (24a, 26b) to change the ability of the user or subscriber to effectuate deals.

57 Claims, 20 Drawing figures

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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File: USPT

Aug 4, 1992

DOCUMENT-IDENTIFIER: US 5136501 A

**** See image for Certificate of Correction ****TITLE: Anonymous matching systemAbstract Text (1):

A matching system for trading instruments in which bids are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to complete trades for the given trading instruments, includes a host computer means (20) comprising means for anonymously matching active bids and offers in the system by trading instrument based on a variable matching criteria, which comprises counterparty credit limit between counterparties (24a, 26b) to a potential matching transaction. The system also includes a transaction originating keystation (24a) for providing a bid on a given trading instrument to the system for providing the potential matching transaction; a counterparty keystation (26b) for providing an offer on the given trading instrument involved in the potential matching transaction; and network means (22) for interconnecting the host computer means (20), the transaction originating keystation (24a) and the counterparty keystation (26b) in the system for enabling data communications therebetween. Both the transaction originating keystation (24a) and the counterparty keystation (26b) for the potential matching transaction each have an associated counterparty credit limit, with the system (20) blocking completion of the potential matching transaction between the transaction originating keystation (24a) and the counterparty keystation means (26b) when the potential matching transaction has an associated value in excess of counterparty credit limit. The assigned credit limits may be reset or varied by the users (24a, 26b) to change the ability of the user or subscriber to effectuate deals.

Brief Summary Text (4):

The present invention relates to matching systems for effectuating trades of trading instruments through automatic matching in which buyers and sellers who are willing to trade with one another based on specified criteria, such as price, quantity and credit, may automatically trade when matching events occur satisfying these criteria, and more particularly to such matching systems in which real time prices are subject to real time credit in determining the quantity of permissible match.

Brief Summary Text (6):

Information retrieval systems for financial information, such as stock market type of information and money market information, normally employ a transfer of data in a high-performance, real-time information retrieval network in which update rates, retrieval rates and subscriber and/or user population are generally very high. An example of such a system is REUTERS DEALING SERVICE which is used in the foreign exchange or money market. Such systems, while providing rapid video conversation capability, are not anonymous systems nor do they provide for automated anonymous trading such as is possible in a matching system. Of course, conversational dealing systems have their place in the market and serve particular needs where appropriate. However, anonymous matching systems are also often desired and, by their very nature, do not normally employ a conversation capability since the

parties to the transactions are unknown until the transaction has been completed. Examples of satisfactory prior art video conversational systems for use in connection with trading of financial information are disclosed in commonly owned U.S. Pat. Nos. 4,531,184; 4,525,779 and 4,404,551, by way of example. Prior art examples of matching systems used in connection with the trading of trading instruments are disclosed in U.S. Pat. No. 4,412,287, which discloses as an automated stock exchange in which a computer matches buy and sell orders for a variety of stocks; U.S. Pat. No. 3,573,747, which discloses an anonymous trading system for selling fungible properties between subscribers to the system; U.S. Pat. No. 3,581,072, which discloses the use of a special purpose digital computer for matching orders and establishing market prices in an auction market for fungible goods; and U.S. Pat. No. 4,674,044, which discloses an automated securities trading system. However, none of these prior art matching systems implements or suggests the use of credit controls to determine the quantity of permissible match at the lowest common credit limit and the best bid/ask price for the largest available quantity to automatically complete a match at trade in which real time prices are subject to real time credit, such as a gross counterparty credit limit between potential parties to a matching transaction. Moreover no prior art matching systems are known to applicants in which an anonymous "more quantity" bid may be employed for additional orders at the same price. In addition, no prior art matching systems are known to applicants in which directed messages are employed between the keystations in the system and the central system to update the local entry order data bases and broadcast messages are employed to update the keystation book which is a restricted subset of the host or central system book. Furthermore, none of these prior art system employ summary books at the local keystations as subsets of the host or central system book.

Brief Summary Text (7):

In the system of the present invention, as opposed to the prior art known to applicants, the central system maintains a data base consisting of all of the trading instruments available for trade, credit information with respect to potential counterparties which may be dynamically varied by the keystations, and the bids and offers that are present throughout the system, while the client sites or keystations, which are subject to gross counterparty credit limits in determining permissible matches, maintain copies of only the best bids and offers and use those to generate a display. Thus, the client sites have some restricted subset of the total depth of the system book located at the central data base. By transmitting only subsets of the total system book from the host, the amount of network overhead that is required is significantly reduced, which reduction is further enhanced by the use of only summary information in the keystation books. Moreover, this enables the central data base maintaining a full set of information for every entry including identification of the parties which identification is not to be provided for the subset books at the keystations in an anonymous trading system, and the assigned counterparty credit limit for all potential counterparties in the system, with these counterparty credit limits not being provided to the keystations and, thus, the gross counterparty credit limits are kept anonymous in the system. The only time that the keystation is made aware of the parties involved in the transaction is after the transaction has been completed, but they are preferably never made aware of the counterparty credit limits assigned to them. In this regard, if the anonymous gross counterparty credit limit is exceeded by the potential transaction the transaction will not be completed. Thus, in the system of the present invention, the host may anonymously inhibit the occurrence of trades even though the price and quantity would otherwise match. The various credit limits are individually set by the keystations, with the anonymous gross counterparty credit limit being the minimum of the two credit limits between counterparties to a potential matching transaction. The individual keystations may reset all credit limits or dynamically vary individual credit limits with such variations sometimes enabling previously inhibited trades to then go forward because the new resulting anonymous gross counterparty credit limit then may no longer be exceeded.

Brief Summary Text (10):

A matching system for trading instruments is provided in which bids are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to complete trades for the given trading instruments such as foreign exchange currencies, in which real time prices are subject to real time credit controls to anonymously block or inhibit the completion of potential matching transactions which do not satisfy an anonymous gross counterparty credit limit. Each of the keystations or client sites in the system assigns trading party credit limits to the other client sites in the system with which it is desired to trade, with these trading party credit limits being maintained anonymously by the host computer and being used by the host computer to anonymously determine gross counterparty credit limits for each potential matching transaction. The gross counterparty credit limit for a given potential matching transaction is the minimum of the trading party credit limits for each of the counterparties involved in the potential matching transaction.

Brief Summary Text (11):

The host computer anonymously matches active bids and offers in the system based on a variable matching criteria which includes the gross counterparty credit limit between counterparties to a potential matching transaction, price, and available quantity. The system comprises the host computer, a transaction originating keystation for providing a bid on a given trading instrument to the system for providing the potential matching transaction, a counterparty keystation for providing an offer on the given trading instrument involved in the potential matching transaction, and a network for interconnecting the host computer, the transaction originating keystation, and the counterparty keystation for enabling data communications therebetween. Both the transaction originating keystation and the counterparty keystation for the potential matching transaction each have an associated counterparty credit limit, with the system blocking or inhibiting completion of the potential matching transaction between the transaction originating keystation and the counterparty keystation when the potential matching transaction has an associated value in excess of the counterparty credit limit. The individual keystations or client sites may individually vary the assigned trading party credit limits which will, in turn, cause the host computer to change the anonymous gross counterparty credit limits in response thereto, or may reset all trading credit party limits which will, in turn, again cause the host computer to change or vary the anonymous gross counterparty credit limits in response thereto. In this regard, the host computer may provide a credit limit alert to the assigning keystation when the assigned trading party credit limit for another keystation goes below a predetermined value, such as 25% of the original value of the assigned trading party credit limit.

Brief Summary Text (12):

The host computer in anonymously matching the active bids and offers in the system, determines the quantity of permissible match at the lowest common counterparty credit limit and the best bid ask price for the largest available quantity for automatically completing the potential matching transaction. Preferably, the host computer, which dynamically updates the prices based on the best available bids in the system, processes the matching transactions for a given trading instrument in time order entry to the matching system, with the matching criteria further comprising an order priority based on price, quantity type and time order entry. With respect to quantity type, it may be a primary quantity type or a more quantity type, with the primary quantity type being disclosed to the other keystations in the system while the more quantity type is maintained as a hidden value of the additional quantity beyond the disclosed primary quantity at which a given keystation is willing to trade for a given trading instrument. Preferably, the primary quantity type has a higher order priority than the more quantity type in the system.

Brief Summary Text (13):

Both the transaction originating keystation and the counterparty keystation, which, of course, can comprise more than one counterparty for a given transaction, for the potential matching transaction each have an associated local data base keystation book comprising a subset of the host book. The content of each of the keystation books has an associated display depth range which is controllable by the host computer and is updatable by transaction update broadcast messages received from the host computer through the network, although the keystation books do not contain counterparty credit limits or gross counterparty credit limits which are kept anonymous by the host. The network is preferably transparent to the transactions communicated via the network. The transaction originating keystations and the counterparty keystation or keystations comprise means responsive to the received transaction update broadcast messages for updating the associated keystation books and further comprise means for providing directed messages to the host computer corresponding to the bid and the offer, respectively. The directed messages, which may include the assigning, changing or resetting of trading party credit limits by the keystations, are processed and used to update the host book. The host computer comprises means for conditionally providing the transaction broadcast update messages to the keystations in the system in response to the presence of an update condition. The update condition comprises updating of the host book and the received bid or offer having a relative value compared with other bids or offers within the host book, which is within the keystation book display depth range of relative values. The subset keystations books preferably comprise accumulated summaries of corresponding bids and offers in the host book, with the summaries comprising an accumulation of common price bids and an accumulation of common price offers. Preferably, the bids and offers comprise logical data. Tokens are used in the system for transmission of the data with respect to users and other information. The keystation book, as was previously mentioned, comprises displayable data having a defined keystation book display depth range, such as the best bid or offer, the next best bid or offer, and so forth, and bids and offers which fall outside that display depth range are not displayed. Thus, the keystation books each comprise a restricted subset of the total depth of the host book with respect to the best bids and offers present in the host book data base. These bids and offers contained in the keystation books are anonymous prior to the completion to the matching transaction. In this regard, preferably a display depth of one for the keystation books would prevent looking into the host book at the keystation. In the system of the present invention, the broadcast messages from the host or central system are broadcast to all of the keystations in the matching system and are used to update the keystation books whereas the directed messages which are sent from the central system or host are directed back only to the keystations involved in the actual matching transaction. These directed messages are used to update the local entry data base or order book at the local keystations involved in the transaction so as to indicate what has happened to the offer or bid at that particular keystation made in connection with the matching transaction. Thus, by employing the distributed matching system of the present invention, real time prices are subject to real time credit controls which may be dynamically varied, to control potential matches which would otherwise occur based on price and quantity, and controllable subsets of a distributable system trading book may be selectively provided to the various trading keystations in the matching system from the host or central system in order to controllably mask the available trading market and efficiently transmit only the required matching information to those keystations which require it.

Drawing Description Text (16):

FIG. 20 is an illustrative diagram of a typical credit limit display of assigned trading party credit limits at given client site in accordance with the system of the present invention.

Detailed Description Text (2):

Referring now to to drawings in detail and initially to FIG. 1 thereof, the system of the present invention is a distributed anonymous matching system for use in

trading various trading instruments, such as different foreign exchange currencies. In the system of the present invention as described herein, the trading is effectuated through anonymous matching as opposed to through the conversation video system described in U.S. Pat. Nos. 4,531,184; 4,525,779; and 4,404,551, commonly owned by applicants' assignee herein. Thus, the distributed matching system of the present invention may be thought of as a computerized exchange in which its central role is to identify a buyer and a seller who are willing to trade with one another based on specified criteria, such as price, quantity and credit, with, as will be described in greater detail hereinafter, real time prices preferably being subject to real time credit. Thus, preferably, credit controls are used to determine the quantity of permissible match at the lowest common credit limit and the best bid/ask price for the largest available quantity to automatically complete a matched trade in the anonymous trading system of the present invention. When such a matching event occurs, preferably the buyer and seller are informed of the trade and sufficient information is then provided to them to complete the physical clearing of the transaction. In order to support this central function, the matching system requires various support functions one of which is preferably the maintenance of summary market information on the participant's workstation or keystation displays at the various client sites. Preferably in the system of the present invention, at all times the system will display the best inside price for every instrument traded on the system. The best inside price is preferably defined to be the highest value bid and the lowest value offer in the system. Preferably the prices are displayed together with the quantity bid or offered at the specified price so that the trader at the keystation can observe the market activity.

Detailed Description Text (3):

By observing the market activity, the trader can decide whether to enter a bid, or enter an offer into the market in an effort to complete a matching transaction. Preferably, the anonymous matching system of the present invention essentially maintains a book of bids and offers in the central system 20 or host computer. A user or keystation at a client site, such as client site 26a or 26b illustrated in FIG. 1, by way of example, interacts with the book by submitting bid, offer, hit, or take transactions. The order entry function is preferably conventionally achieved through data entry using a conventional keyboard, pointing device such as a mouse or any other conventional data entry tool. The central system 20 validates the transaction request, processes the bid, offer, hit or take according to the rules of the market, and attempts to find matches between this new entry and the other bids and offers posted in the system book, subject to gross counterparty credit limits, as will be described in greater detail hereinafter, between the potential counterparties to a potential matching transaction. If a match is found, and satisfies all criteria, including not exceeding the gross counterparty credit limit, then the trade is automatically executed, the participants to the trade are informed, all databases and trader screens are updated as to the quantities traded and the quantities remaining and, if desired, a clearing agency may be informed as to the details of the trade so that payments and exchanges may be completed. If, on the other hand, a match cannot be found, or the gross counterparty credit limit is exceeded by the potential match which would otherwise match based on price and quantity per se, then the system preferably either disposes of the entry for hit or take or keeps the entry for bid or offer for later processing. Preferably in all cases transactions are processed to completion according to certain rules to be described in greater detail hereinafter and the various client sites 26a, 26b preferably receive real-time updates of the new status of the trading instruments. Thus, as shown and preferred in FIG. 1, the client site systems 26a and 26b only two of which are shown by way of example in FIG. 1, submit transactions, such as represented by reference numeral 30, as well as assigned trading party credit limits, to the central system 20 via the communication network 22. As will be explained in greater detail hereinafter with reference to FIG. 6, the submission of a transaction 30 from a client site 26a or 26b to the central system 20 will preferably result in one or more messages, represented by reference numeral 32, going directly back as a directed message to the client site 26a in this example,

which initiated the transaction message. Another effect of the transaction message 30 being sent to the central system 20 is that for certain sorts of transactions, a broadcast message 34 is generated by the central system 20 which is then delivered to all client sites 26a, 26b attached to the central system 20. Thus, the directed response or the directed message 32 only goes back to the particular client site 26a and, more particularly, the particular keystation, 24a by way of example, at that client site 26a which initiated the transaction message whereas the broadcast message 34 goes to all client sites 26a, 26b and all of the various keystations associated at those client sites 26a, 26b. With respect to the assigned trading party credit limits, it is these limits which are used by the central system 20 to determine the anonymous gross counterparty credit limits which are used to control the completion of matching transactions. By way of example, in FIG. 1 a typical client site 26a is shown as having keystations 24a, 24b, 24c through to 24n with the number of keystations merely being limited by the capacity of the system and the desired processing time. With respect to the distribution of the functionality in the system of the present invention, the communication network 22 preferably does not really play a part in that it is transparent to transactional information. By this what is meant is that when the transactional information leaves the client site 26a, for example, it could be, if desired, encrypted or garbled in a way that the only other entity which could understand it would be the central system 20 and that would be irrelevant to the function of the network 22 since the network does not look at the messages, does not process the messages, and merely transfers these messages to the appropriate parts of the system, such as to the central system 20. In this regard, the network 22 is functioning similar to a paired cable in that it is a conduit to pass the information back and forth. Of course, the network 22 has various other communication functions which, however, for purposes of understanding the present invention are unnecessary to go into. Suffice it to say that preferably, the communication network 22 uses a protocol which can be termed hierarchal fan-out in which one node transmit to multiple nodes which in turn transmits to multiple other nodes. Thus, network 22 helps implement broadcast capabilities integrated with a message switching network to achieve full tolerance and broadcast distribution. It should be noted, when a potential match occurs, and the gross counterparty credit limit is not exceeded for that potential match, the central system 20 will preferably send directed messages or responses to all of those parties in the system that were involved in the match, so that, in some instances, two, three or more client site 26 maybe involved in receiving the directed message. However, this still differs from the broadcast message which is sent to all client sites irrespective of their involvement in a particular match.

Detailed Description Text (5):

Referring now to FIG. 3, the data flow in accordance with the present invention is illustrated with respect to a situation in which there is a hit bid resulting in a trade. In this situation, there is substantially more activity than in the situation previously described with reference to FIG. 2. Thus, as shown and preferred in FIG. 3, if keystation 24b submits a transaction called "hit bid", represented by reference numeral 62, to the central station or host 20, a hit acknowledgment or HIT-ACK, represented by reference numeral 64, is provided back to keystation 24b as a directed message. At that point, the central system 20 will recognize that a match is possible because the "hit bid" message says that keystation 24b is willing to trade at the bid price. Assuming that the gross counterpart credit limit is not exceeded for this potential matching transaction, the central system 20 will determine that a match is possible. Preferably, however, before committing to the match, the central system 20 may get involved in a risk limiting protocol using a transaction desk 70 which determines whether the trade is possible, and if so, acknowledges this to the central system 20. Assuming that a trade is possible, and the gross counterparty credit limit has not been exceeded, then a match occurs. At that point several messages are generated from the central system 20. One of these messages is termed the match message, given reference numeral 65, which is a directed message that goes to the bidder, which in this instance is keystation 24b, and to the keystation 24a which originally owned the

bid. Thus, in this instance, directed messages go to more than one keystation 24. Preferably, every match must be acknowledged so there is a match acknowledgment message, MATCH-ACK which comes back from the buyer and seller keystations 24b and 24a and is used to determine that the match was in fact received correctly and that the deal can be considered complete at that point. In addition, a broadcast message is generated that a trade has occurred which trade update message, given reference numeral 67, may possibly cause a new best bid to occur or could affect the quantity or price at the top of the book. Again, if the trades and best bids go into the ticker 60, then this information is provided to the ticker as well. Similarly, if clearing information is provided to a clearing house, this too occurs as represented by reference numeral 69. In addition, as shown and preferred, trade tickets may also be generated. Thus, trade ticket information is also preferably provided to the participating keystations 24a and 24b so that the trade tickets can be generated.

Detailed Description Text (6):

Referring now to FIGS. 4 and 5, illustrations of typical books employed in the distributed matching system of the present invention are shown, with FIG. 4 illustrating a typical book at the central system 20 and FIG. 5 illustrating a typical keystation book at a typical keystation such as keystation 24a, based on the book of FIG. 4. The central station or host book illustrated in FIG. 4 is a logical model of the book market pre-posting and is divided into a bid side and an offer side. Each box in the diagram preferably stands for an entry into the side of the market. The value in the upper left hand corner of the box represents the price of the trading instrument and the value in the lower right hand corner represents the primary quantity of the trading instrument. As further shown and preferred in FIGS. 4 and 5, on the bid side the highest absolute value is at the top of the book and the lowest absolute value is at the bottom of the book, whereas on the offer side the worst relative offer value is at the top of the book and the best relative offer value is at the bottom of the book. In addition the time order of bids and offers goes from left to right with, on the bid side, the last bid being left most and the first bid being right most, whereas on the offer side, the first offer is left most and the last offer is right most. This convention is also followed in connection with the keystation book of FIG. 5 which is a subset of the system or central station or host book of FIG. 4. Thus, as can be seen in FIG. 5, the keystation books located at the client sites 26 maintain copies of the best bids and offers contained in the host book of FIG. 4 and use that information to generate displays at the keystations 24. In addition, as was previously mentioned, the display depth of the keystation book is controlled by the host computer 20. For example, in FIG. 5, a display depth of 3 is illustrated on the bid side and the offer side. It is this display depth which helps restrict the subset of the total depth of the book contained at the host computer or central system 20. In reality, there are two controls on the display depth, one is a central control by the host computer 20 which determines the maximum possible display depth for the keystation book, and the keystation 24 itself which, within that maximum parameter, can further limit the display depth of the book. Of course, the host computer also restricts the subset of the host book by limiting other information such as by withholding the identities of the parties until the transaction is completed and such other things as net together prices, and net together quantities, and maintains gross counterparty credit limits anonymously, not distributing assigned trading party credit limits to the keystations. It should be noted that in the illustrative example of FIGS. 4 and 5, bids and offers of equal goodness are drawn on the same order down the line. The central system book maintained by the host contains detailed information from each client site on the particulars of each bid or offer. Preferably each bid and offer is identified with a token to give it a unique handle by which it can be referred to in future transactions and is time-stamped based on entry into the system. As further shown and preferred in FIG. 5, the keystation book is a summary book which contains accumulated summaries of bids at the same price and offers at the same price. Thus, by way of example, block 71 in FIG. 4 is a summary of blocks 73, 75 and 77 in FIG. 4, which shows a total

quantity of 10 at the price of 138.86, and block 80 is a summary of blocks 82 and 84 in FIG. 4 which shows a total quantity of 14 at the price 138.38. Similarly, on the offer side, block 86 is a summary of blocks 88 and 90 in FIG. 4, showing a total quantity of 9 at an offer price of 139.9, and block 92 is a summary of blocks of 94, 96 and 98, showing a total quantity of 13 at an offer price of 139.70. It should be noted that with respect to the offer side of FIG. 5, since the display depth is only three, the fourth worst offer represented by block 100 in FIG. 4 does not appear in the keystation book of FIG. 5 since it is outside the designated display depth range.

Detailed Description Text (7):

With respect to the user entry record maintained at the central database 20, preferably such items as the bidder offer indicator, the instrument ID number, the quote, the quantity, the time-stamp, the keystation transaction number, the host transaction number, the assigned trading party credit limits, etc. are maintained. If desired, different trading instruments may be quoted in different ways. For example, you may have some trading instruments quoted on the basis of absolute price and others on the basis of yield or discount, and so on. In addition, clearing information may be stored at the central system 20. As was previously mentioned, this type of information fully qualifies the entry to the host computer or central system 20 which can perform matching based on gross counterparty credit limits and the collection of bids and offers that it has at any particular point in time, whereas the client site or keystation 24 preferably maintains copies of only some of these fields so that it can create displays. Thus, the host or central system 20 reduces the amount of network overhead that is required by transmitting only summary information about the book and typically restricts the price depths that are sent down, such as the depth of three given in the example of FIG. 5. In addition, as previously mentioned above, the host will aggregate quantities at the same price level as illustrated in FIG. 5. In allocating the accumulated summary to a match, the rules generally followed are that it goes by price, time of entry to the system, and by credit.

Detailed Description Text (8):

Now we shall briefly discuss the IXM update message structure for broadcast messages. IXM as used herein is another name for the book or an instrument crossed with a market. The book maintenance protocol or operation block protocol is preferably a way for instructing the client sites 26 to add, drop or remove particular sub-books from their associated book displays. Preferably, the host 20 enforces a structure on the client site data base which is a queue of prices whose maximum display depth is that display depth that the host enforces for that particular instrument. The IXM update message is a broadcast message which preferably contains a number of fields, such as the identifying information for the trading instrument that is being effected by this updated message, with the information being tokenized in order to minimize the bandwidth used on the network. Thus, very short numbers are used to indicate things like the trading instrument or the user or the subscriber that the system is trying to affect. In this instance, the IXM update message instructs the client site 26 to update the information being maintained in a particular instrument and contains an IXM token. As shown and preferred in FIGS. 7 and 8, the IXM update message contains a number of fields for providing the requisite summary information, such as the number of highs, lows, trades, etc., which information is used to key into the rest of the message. Preferably IXM updates are cumulative and apply to the then current state of the book maintained at the client site 26. Thus, the IXM update preferably contains new information about an IXM and the state in context of the instruments book. The message is preferably of variable length and may or may not contain certain information blocks. The IXM sequence number field preferably represents a number of updates to an IXM. The keystation 24 uses this value to preferably ensure that it receives all updates to an IXM and that it does not apply an outdated update. The block list size preferably defines how many information blocks are required for the IXM. Preferably the size of the operations list may exceed the maximum size of the

message. In such an instance, the IXM is segmented across multiple messages. The number of highs specifies that a high quote is being sent, which typically would be only a one or zero. Similarly the number of lows specifies that a low quote is being sent, which would typically only be a one or a zero. The number of trades preferably specifies the length of the trade list for the message which is used for the last trade statistic as well as for support of the ticker. Typically the IXM image would only have, at most, a single trade block to indicate the last trade if there was one. The number of operations preferably specifies the length of the operation list for the message. If the block list size does not equal the sum of the number of highs, number of lows, number of trades, and number of operations, the IXM has been segmented across multiple messages. At least one IXM segment message will then preferably follow. When the sum of all the number of highs, lows, trades and operations fields across the segmented messages equal the block list size, then preferably the IXM data set is complete.

Detailed Description Text (10):

It should be noted that, preferably, with a single parameter change at the host system 20, effectively the view which the entire "world" or system population obtains with respect to a particular instrument is effectively changed. In this regard, if the host system 20 sets the display depth equal to one then, preferably, that means that no one can look into the book and that the host will not send out updates off of the best price display. This display depth can, of course, be dynamically changed by the host on a daily basis or on any other periodic basis desired to provide centralized control over the distribution of the book. It should be noted that preferably all of the data in the system is logical data; that is all of the fields have meaning to the system.

Detailed Description Text (11):

In this regard, in order to understand the distributed book structure of the present invention, it should be understood that a book as used herein is the repository for bids/offer information on a particular trading instrument. Depending where that book is maintained, the sort of information that goes into it is going to be different so that the repository for bid/offer information on a given financial instrument, such as Japanese Yen, in the host 20 contains things like individual bids and offers, their identities, the clearing information and all of that maintained in strict price/time priority; whereas the book on Japanese Yen maintained at the client site 26 preferably contains some summary information about the total quantity bid and offered at a particular price, and does not contain all bids and offers, it only contains the ones that are appropriate.

Detailed Description Text (12):

There are actually two collections of information which are being maintained at the client site 26. One of these collections of information is the book for each instrument which is maintained at the keystation 24 sites which have been given reference numerals 110, 112, by way of example in FIG. 6. Another book maintained at each site is the local entry data base or order book which has been given reference numerals 114 and 116 in FIG. 6. As previously mentioned, there is also the host or system book database, given reference numeral 118 in FIG. 6. Each time a client site 26 starts up as a keystation 24, as was previously mentioned, the keystation 24 is preferably initially empty and requests the download of the currently active books from the central system 20. As was previously mentioned, separate books are maintained for each trading instrument, so there would be a separate book for Japanese Yen, a separate book for Deutsch Mark, a separate book for dollars, etc., assuming that the system of the present invention was used for trading foreign exchange currencies. Each of these books would be maintained at a given display depth. In this regard, it should be noted that an IXM update broadcast message is only broadcast when the price information is inside the assigned display depth that has been assigned by the host computer or central system 20. With respect to the local entry database or order books 114, 116, these order books 114, 116 are updated by directed messages from the central system 20

and/or record the orders of the particular keystation 24b or 24a which have been sent to the central system 20. In this regard, these order books 114, 116 are preferably kept current so that it is a listing only of orders which are still present in the central system 20 from the respective keystations 24b or 24a. This order database 114 and 116 gets modified, such as through the removal of data, due to various occurrences, such as when a complete match has occurred for a given order an entry remove message is provided, or if it is partial match you may get an entry message that tells you that only that a partial match has been done against that order. The match notification which was previously referred to preferably refers to a particular order that is contained in the order database 114 or 116 and indicates what quantity or portion of the order has been matched. If all of the order has been matched, the entire order is then preferably deleted from the respective order database 114 or 116. By way of example, if a bid were put in for ten million Yen at a price of 127 and the display was enabled, that is the display depth was set to something greater than or equal to one, then the central system 20 would preferably construct a broadcast message, which is the aforementioned IXM update broadcast message, which would inform all client sites 26 that a new bid had been added to the Yen book, assuming that were the instrument being traded. The IXM update message would instruct an operation block which would say add to index one the ten million at 127. As for the other parameters in the IXM update message, add index would equal one, type would equal bid, quote would equal 127 and quantity would equal ten million. In the above example, the transaction achieves two functions. The first function it achieves is that a bid is submitted and the host system 20 responds to the keystation 24a submitting the bid that the bid was accepted and that there was no ambiguity in that the bid is definitely in the system 20, the system 20 has it, and the local entry database 116 has it. The other function indicates that the bid was of a certain characteristic that the rest of the "trading world" in the system should know about and this is accomplished as a result of the IXM broadcast message which was generated to all of the client sites 26 which were then told about this in summary as opposed to being given all of the detailed information. It should be noted that, as previously mentioned, in terms of functional operation, the entry of a bid to the system is the same as entry of an offer.

Detailed Description Text (14):

Referring now to FIG. 6 in greater detail, the network 22 which, as was previously mentioned, is transparent to transactional information has been omitted for purposes of explanation of the message flow in the system of the present invention. For purposes of the example of FIG. 6, keystation 24a can represent any keystation which originates a transaction and keystation 24b can represent any keystations which are involved as counterparties in the transaction which, as was previously mentioned can be more than one keystation at more than one location. The keystations 24a and 24b are normally remotely located from each other such as, for example, keystation 24a being in New York and keystation 24b being in London. In addition, the keystations 24a and 24b are remotely located from the central system 20. In order to understand the message flow illustrated in FIG. 6, we will assume that the originating keystation 24a is receiving a display of the keystation book database located at keystation 24a. Assuming that the operator at that keystation 24a then desires to enter a bid or an offer, either of which will be termed an order, this information is input to the keystation 24a via conventional means, such as a keyboard or a mouse by way of example. The keystation 24a then preferably validates the order and maintains its local order data base or local entry data base 116. The order, instead of being a bid or an offer, could be a hit or a take for a particular trading instrument as well since all of these various items would constitute an entry of an order. After the order has been entered, validated, and, the order data base 116 maintained, a transaction message is built and sent as a directed message to the central system 20. This is represented by reference numeral 120 in FIG. 6. This transaction message 120 is received by the central system 20 and contains transaction information. At this point, preferably the central system 20 sends back a directed message, termed a command acknowledgment message and given

reference numeral 122, to inform keystation 24a that the transaction message 120 has been received. The transaction message 120 is time-stamped by the central system 20 at this point. Preferably the display of keystation 24a will indicate "please wait" until the transaction message 120 has been acknowledged. Preferably, such acknowledgment happens relatively quickly, such as in about two seconds, by way of example. The central system 20 then preferably processes the transaction message 120 against the central system 20 stored copy of the system or host book which is contained in the host book data base 118 subject to gross counterparty credit limits. At this point, the central system 20 preferably either adds the entry of the transaction or the order from keystation 24a to the host book data base 118 or matches that entry against existing bids and offers contained in the host book data base 118. Once that processing is completed, assuming the gross counterparty credit limit has not been exceeded, the central system 20 is ready to generate output messages not only to the originating keystation 24a, but possibly to other keystations 24 such as the counterparty keystations represented by 24b and, assuming the gross counterparty credit limit between keystations 24a and 24b has not been exceeded and that an update message is required, to all keystations in the system. Thus, central system 20 generates directed messages back to each of the keystations 24 involved in the matching transaction, such as 24a as the originating keystation and, assuming that there is a match, 24b as the counterparty keystation, and generates the IXM update broadcast message to all keystations 24. It should be noted that, as previously mentioned, a single transaction message 120 from keystation 24a, whether it is a hit, or a take, or a bid, by way of example, could result in multiple matches. For example, if keystation 24a wants to hit the bid for a quantity of 20, it is possible that to satisfy that order more than one match could be involved such, as for example, four or five different matches, particularly, since the keystation book at keystation 24a merely displays accumulated summaries of the bids or offers, such as represented by blocks 71, 80, 86 and 92 in FIG. 5. If multiple matches occur, then, thereafter, the identity of all of the counterparties involved in the multiple matches are displayed on the screen of the originating keystation 24a for a settlement purposes. Thus, on any given transaction, there will always be directed messages involving the transaction originator and involving one or more counterparties or affected parties in that trade or transaction. If the market is an auction market, then it preferably has a price depth of one so that this determines how many prices the central system 20 can maintain with only one price being maintained in an auction market. When a new bid goes in which betters the existing bid in an auction market, the existing bid is actually removed and effectively cancelled in the book. By way of example, an auction market is represented by FIGS. 15 and 16. Preferably, after all of the directed messages are generated to the counterparties, and the associated directed message acknowledgments, such as represented by reference numerals 124, 126, 128 and 130 in FIG. 6, the IXM update broadcast message, represented by reference numeral 132 in FIG. 6, is sent to all keystations 24 in the system regardless of whether or not they were involved in this particular matching transaction. It should be noted that preferably the first six steps illustrated in FIG. 6 with respect to the central system 20 are all essentially a-synchronous to any outside events. When the keystations 24a and 24b received the update broadcast message it will be processed against the local keystation book database 110, 112 and the local copy of the book will be maintained. As was previously mentioned, it should be noted that this local keystation book 110, 112 is not an exact carbon copy of the central system book 118 but rather is only a selected subset of it which comprises an accumulated summary of bids and offers within the assigned display depth. Thus, preferably, FIG. 6 illustrates a generic template for the processing of messages throughout the system of the present invention in order to provide the distributed functionality of the system.

Detailed Description Text (15):

It should be noted that the concept of originating keystation and counterparty keystation moves around with each transaction so that for each transaction the originator may be different and may for different transactions occurring at the

same time be an originating keystation in one instance and a counterparty keystation in another instance. In addition, there are other instances in which the keystation may merely be a bystander and not involved in the particular transaction at all. Preferably the control of the overall distributed matching system is maintained by the central system 20 which operates in accordance with a set of rules, to be described in greater detail hereinafter, which govern how the transactions are processed. Preferably, the central system processes transactions against a particular trading instrument in time order of entry into the system. In this regard it should be noted that it is not time entry of orders per se but time entry of orders related to a particular trading book or trading instrument. Thus, there would be time order entry assigned to Yen, a different time order entry consideration assigned to Deutsch Marks, and so forth if the trading instruments were foreign exchange currencies.

Detailed Description Text (18):

Referring once again to FIG. 17 and 18, matching is only attempted, preferably, when the posting function indicates that the best bid value is better than or equal to the best offer value. The matching function is preferably the same for both book markets and auction markets. In a book market, it is possible for any order to cross the market; that is, for a new bid to be higher than the best offer or a new offer to be lower than the best bid. In this case, trades are preferably allowable at multiple quotes filling the order starting at the best quote and working down to the quote specified in the new order as necessary to trade as much quantity as possible. Since the quote depth for an auction market is only 1, just the bid side and the offer side of a market are submitted to matching. If one or more matches are found, the following information is preferably given for each matching pair; namely, the buyer, the seller, the instrument, the quantity traded and the quote. As is shown by way of example in FIG. 17, there is a bid which has been introduced at the value of 139.19, a value that betters the current best bid. Since there exists no sub-book on this price on the bid side of the book, a new one is created. At this point, the best bid value is equal to the best offer value so the bid and offer sub-books with the value of 139.19 are submitted to the matching function. Assuming that the gross counterparty credit limit is not exceeded, then both of the offer entries are fully traded for a trade total quantity of nine. The bid is only partially traded and a quantity of one remains. It should be noted that with respect to FIG. 4, there are seven sub-books in the market, three on the bid side and four on the offer side with a value spread between the bid side and the offer side of the market currently existing so that no matching could take place at that time. FIG. 18 illustrates the logical model of the book market after the trade is over. In this instance the offer sub-book with a value of 139.19 in the above example has no more entries in it so the sub-book is removed. There is a bid remaining at that quantity so it remains in the sub-book. A new value spread now exists in the book.

Detailed Description Text (19):

Thus, with the system of the present invention, the books may be distributed among the keystations through the use of summary books so that information is distributed between the central system 20 and the keystations 24 in such a way that all of the right information, and only the right information, is made available at the geographically dispersed keystations. The keystations 24 need information to generate their displays which displays, in the system of the present invention, can be as up to date as possible so that the traders are provided with accurate information regarding the instruments available for trade while the keystations 24 are prevented from receiving disclosure information that they are not entitled to or that should be withheld from them because it is an anonymous trading system. Thus, not only does the distributed matching system of the present invention provide for efficient transmission of information but it enables the host to controllably mask the available trading market.

Detailed Description Text (20):

Now referring to FIGS. 19 and 20, the credit control function and the more quantity function of the system of the present invention shall now be described in greater detail. As was previously mentioned, there are two types of quantity in the system of the present invention; namely primary quantity and more quantity. Primary quantity is the amount which is disclosed in connection with the books distributed to the keystations 24 from the host 20 whereas more quantity is kept anonymous by the system of the present invention. Thus, the more quantity is not disclosed to the market at the time that the bid or offer is made but rather is hidden. In addition, as previously mentioned, credit limits are also anonymous in the system of the present invention. These trading party credit limits which are assigned by the individual keystations 24 or client sites 26 to those other keystations 24 or client sites 26 in the system in which they wish to trade, or not trade as the case may be, are preferably held anonymously in the central system 20 which determines the gross counterparty credit limits. Thus, the only individuals who know what the trading credit limits are are the owners of those credit limits; that is, the keystations 24 assigning the particular trading party credit limit. In this regard, if a trading party credit limit is set to zero then you will not trade with that party. Preferably, in determining the rules of matching to be applied by the system in the present invention, a bid can only match with an offer and an offer can only match with a bid. Thus, an order eligibility is preferably determined which says that eventually bids with offers, where there is a non-zero credit line between the counterparties for the same trading instrument, are eligible for a match where the buy price is greater than or equal to the sell price. Next, there should preferably be a quantity match, with the match quantity preferably being equal to the minimum of credit, remaining quantity of the new order, or remaining of the standing order. Thus, the match quantity is the minimum of these three things. In this regard, preferably the match may occur to the entirety of an order as opposed to distributing the order or match amongst several possible orders. In addition, preferably the priority of matching is based on time precedence; in other words, first in first out. Preferably the system of the present invention tries to maximize the total trade size each time a match occurs. In determining standing order priority, preferably it is based first on price, second on quantity type, and third on time stamp or time of entry into the system. Preferably in considering quantity type, the bid with more quantity is considered to be two bids, one of which is an offer of primary quantity at a certain price and then an offer for more quantity at a different price. Preferably the primary quantity has a higher priority than the more quantity type. By way of example in trying to understand the more quantity concept, assume that there is a new order which is bid at a dollar for quantity of 30. The system will first determine that this order should be matched against standing orders that are eligible. Assuming all the orders are eligible orders, then the system is going to say that against each one it will trade up to its maximum and will keep trading until its all done. In this regard, if in the course of matching you run up against a credit limit which causes the gross counterparty credit to be exceeded, then the matching trade occurs up to the gross counterparty limit so that the match size is the minimum of the credit, the standing order size or the primary size. As was previously mentioned, the system of the present invention basically operates with credit limits on the concept of gross counterparty limit. In this regard it is not enough for a keystation 24 to extend a trading party limit to a counterparty, it is also preferably necessary that the counterparty extend a trading party credit limit to that keystation, in which instance the minimum of the two trading party credit limits would represent the credit line or gross counterparty limit between the two keystations. By way of example, if the keystation 24a buys 10 million dollars worth of Deutch marks from another keystation 24b and sells 10 million dollars worth of Deutch marks to that same keystation 24b, that transaction would have consumed 20 million dollars of the gross counterparty credit limit between these two keystations 24a, 26b. Of course, if desired according to the system of the present invention, any trading party credit limit can be changed or all credit limits may be reset. Preferably the minimum of the credit that a keystation 24 has remaining with another keystation 24 and the credit that that keystation 24 has with the originating keystation 24 will

determine the maximum possible match size.

Detailed Description Text (21):

In addition to the above, there is a credit alert threshold. Preferably the permission to modify credit limits in the system of the present invention is only given to somebody having that special privilege. Preferably, if in the course of trading your credit remaining goes to a value less than 25% of the original value of the credit limit, an alert is sent out to anybody with permission to modify the limit. Thus, the credit limit alert informs a particular keystation 24 that it is trading dangerously low to the assigned credit limits it has given and that those limits are going to start blocking or inhibiting trades if nothing is done about changing them. As was previously mentioned, although credit limits are assigned to individual keystations 24 they are held in the central system 20 so that when a potential matching trade is to occur, it's not the keystation 24 function to determine the size of that trade but rather it is the central system 20 function. Because of credit limits, it is possible that a bid or offer could be put into the system which is not capable of being matched with any other bid or offer because all of the trading party credit limits assigned by the originating keystation 24 are zero or because no other keystation 24 in the system has extended a trading party credit limit to the new keystation 24 entering the system.

Detailed Description Text (22):

Furthermore as previously mentioned, the matching algorithm employed in the central system 20 of the present invention preferably uses credit controls to determine the quantity of permissible match to the lowest common limit and the best bid/ask price for the largest available quantity to automatically complete a matching transaction or trade. Thus, a matching system is provided in which real time prices are the subject of real time credit. Moreover it should be noted that preferably prices of the best available bid are used to dynamically update prices.

Detailed Description Text (23):

Summarizing the presently preferred matching rules for the system of the present invention, a new order is eligible to be matched with a standing order and a trade or matching transaction will result whenever one order is a buy order, the other is a sell order, the buy order and sell order originate from different entities, a non-zero and credit line exists between the two entities, the two orders are against the same instrument, and the price of the buy order is greater than that of the price of the sell order. Secondly, if an order match is possible according to the above criteria of order eligibility, then the trading transaction would take place at the price of the standing order preferably. Moreover if an order match is possible according to the criteria of order eligibility, then the trade will preferably take place for a quantity equal to the minimum of the available credit line, the remaining quantity of the new order, and the remaining quantity of the standing order. Whereas the order eligibility rule defines the criteria for matching, the quantity rule is used to define the size of an eligible trade. Preferably, if there are multiple standing order eligible for matching against a new order is then matches will be considered in priority sequence until one of the following conditions are obtained; namely the new order completely filled or all eligible standing orders have been considered. Thus, simply stated, each new order is traded to its maximum potential. Preferably the priority of the standing order relative to other standing orders for the same instrument is based on price, quantity type, and time stamp. With respect to price, for buy orders, preferably the higher price is the higher priority and for sell orders the lower price is the higher priority. With respect to quantity type, preferably a standing order for primary quantity has a higher priority than a standing order for more quantity if they are both at the same price. With respect to time stamp, preferably within the same price and same quantity type, older orders have a higher priority than more recent orders. Thus, the sort sequence for standing order priorities preferably by price, the quantity type, by time stamp. In this regard, however, if more quantity is at a better fill price, then it has a higher priority than primary quantity.

Detailed Description Text (24):

Whenever a party initiates a credit change transaction which increases the credit extended to one or more counterparties the following sequence of events occurs: credit changes performed; all the subscriber's bids and offers in crossed markets, which is a market in which to bid price is equal to or greater than the offer price, are evaluated for trade potential with standing orders on the opposite side of the book; if any single instrument contains multiple bids or offers from the entity who has performed the credit change, then these bids and offers are evaluated in time sequence; and if the party who has performed the credit change has bids and offers in multiple instruments with crossed markets, then the individual instruments are evaluated in an arbitrary sequence.

Detailed Description Text (25):

Preferably, the system of the present invention supports four different order types which are used to buy or sell instruments in the matching system of the present invention. These order types are referred to as bid, offer, hit (also known as yours), and take (also known as mine). These orders are preferably differentiated from one another according to a set of time, price and size constraints which are either explicitly or implicitly provided at the time of order entry. Preferably all system orders, regardless of type, are price limit orders. This means that the order, whether it be bid, offer, hit, or take, is preferably restricted to execute at the specified price or better. For a bid or take, the term "or better" preferably means at the specified price or lower, whereas for an offer or hit, this term preferably means at the specified price or higher. Furthermore, every system order must preferably carry one of two possible time constraints which are actually implied by the order type. Hit and take orders have the implied constraint fill-or-kill (FOK). These orders must be fully or partially filled at the time they are presented and then they are removed from the system or killed. Bid and offer orders preferably have the applied constraint good 'till cancel (GTC). These orders preferably must remain in the system until explicitly cancelled or until the end of the user's session. In addition to these order limitations, all orders must preferably specify primary quantity. In the case of bid and offer orders, more quantity may also be preferably included with the order but only if a primary quantity is also included. FIG. 19 is an illustration of the order types implemented in the system of the present invention with fill-or-kill represented by the expression FOK and good-till-cancel represented by the expression GTC. It should be noted that preferably hit or take specifies a price which crosses the market, that is a hit with a price lower than the best bid, and is effectively a market order in the sense of the commodities markets and will execute at the best available price, and will go as far into the order book as needed until the order is filled or the limit price is reached.

Detailed Description Text (26):

With respect to the credit control mechanism of the present invention, it comprises gross counterparty credit limit controls, as was previously mentioned. Thus each party is allowed to extend a credit limit or trading party credit limit to any other counterparty in the system. It is the act of extending a trading party credit limit which allows trades to take place between two keystations 24. Assuming two keystations 24 have each extended credit to one another, they will be allowed to trade until the remaining credit reaches zero. Every trade will draw down the available credit line for both sides of the trade and preferably, no trade may take place unless sufficient credit is available on both sides.

Detailed Description Text (27):

Basically four credit control functions are implemented in the system in the present invention. These functions are modified credit limits, reset credit limits, view credit limits, and credit limit alert. When the modified credit limits function is involved, the user is preferably presented with a list of all subscribers on the system. The user desirous of modifying credit limits may then

assign a numerical credit limit to any subscriber in that list. When complete, a new list of trading party credit limits is sent to the host or central system 20 thereby defining a new current and future default credit limit for the originating subscriber. In addition, at any time, a user may invoke the reset credit limits function thereby resetting all counterparty credit limits to their original default values. This function would normally be performed prior to the start of trading each day. Credit limits are preferably reset for each counterparty to the last value specified in a modified credit limit function for that counterparty. In order for a trader to see how much of the original credit line remains to other subscribers, a view credit limits function may be selected. When this function is executed, the central system 20 preferably supplies a list of all counterparties to whom a credit line has been extended, together with the dollar amount of the original credit limit which remains. The information is preferably provided as a snapshot; namely, it will not dynamically update as trades take place. As was previously mentioned, the credit limit alert function identifies an impending total draw down of counterparty credit lines. Preferably, the credit limit alert is sent once for each trade performed after the 75% threshold is reached. The credit limit alert is only preferably triggered when a trade occurs within the threshold region. If the credit becomes totally exhausted, then preferably no further trading will occur and no further alerts will be generated. Preferably, any user or keystation 24 may retrieve his and only his site's credit list for viewing only, with the information being presented, by way of example, in the form illustrated in FIG. 20. In FIG. 20, the credit limit field is the maximum gross dollar amount of trading permitted between the requestor organization and the identified counterparty organization, and the credit remaining field is the original credit limit plus all trades executed since credit was reset with this counterparty. The display is preferably non-updating; that is the credit remaining column will not change once on display even if trades take place within the named organization.

Detailed Description Text (28):

Thus, by using credit control in accordance with the present invention, subscribers may limit the amount of credit exposure they have with other subscribers in the system of the present invention, with credit control being managed as a gross counterparty limit extended on a subscriber-to-subscriber basis across all trading instruments. In accordance with the system of the present invention, completion of potential matching transactions between transaction originating keystations and counterparty keystations are inhibited or blocked when the potential matching transaction has an associated value in excess of the gross counterparty credit limit. Thus, the credit control mechanism of the present invention controls who subscribers trade with in an anonymous trading system which is important since the identities of the parties involved in a trade are not revealed until after the trade has taken place at a time which would be too late to unwind the trade.

Current US Class (1):

705

CLAIMS:

1. A matching system for trading instruments in which bids are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to complete trades for said given trading instruments, said system comprising a host computer means comprising means for anonymously matching active bids and offers in the system by trading instrument based on a variable matching criteria, said matching criteria comprising a dynamically variable counterparty credit limit between potential counterparties to a potential matching transaction; a transaction originating keystation means for providing an offer on said given trading instrument involved in said potential matching transaction; and network means for interconnecting said host computer means, said transaction originating keystation means and said counterparty keystation means in said system for enabling data communications therebetween, both

said transaction originating keystation means and said counterparty keystation means for said potential matching transaction each having an associated counterparty credit limit, said system inhibiting completion of said potential matching transaction between said transaction originating keystation means and said counterparty keystation means when said potential matching transaction has an associated value in excess of said associated counterparty credit limit, each of said keystation means comprising means for variably assigning a trading party credit limit for said potential counterparty to said potential anonymous matching transaction, said keystation trading party credit limit assigning means comprising means for dynamically varying said assigned trading party credit limit for said potential counterparty for providing dynamically variable real time credit control between said potential counterparties to said potential matching transaction, said associated counterparty credit limit being based upon said assigned trading party credit limits for each of said counterparties involved in said potential matching transaction, said dynamically variable assigned trading party credit limits being provided to said host computer means from said keystation means for providing said associated counterparty credit limit, said host computer means being dynamically responsive to said keystation provided dynamically variable assigned trading party credit limits for dynamically varying said variable matching criteria based thereon for providing said dynamically real time credit control for said anonymous matching transactions between said individual keystations.

2. A matching system in accordance with claim 1 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

3. A matching system in accordance with claim 2 wherein said counterparty credit limit is a gross counterparty credit limit.

4. A matching system in accordance with claim 1 wherein said counterparty credit limit is a gross counterparty credit limit.

5. A matching system in accordance with claim 1 wherein said matching criteria further comprises real time prices of said bids and offers, said real time prices being subject to said counterparty credit limit in real time.

6. A matching system in accordance with claim 5 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

7. A matching system in accordance with claim 6 wherein said counterparty credit limit is a gross counterparty credit limit.

8. A matching system in accordance with claim 5 wherein said counterparty credit limit is a gross counterparty credit limit.

9. A matching system in accordance with claim 5 wherein said matching criteria further comprises associated quantity value of said given trading instrument bids and offers.

10. A matching system in accordance with claim 9 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

11. A matching system in accordance with claim 10 wherein said counterparty credit limit is a gross counterparty credit limit.

12. A matching system in accordance with claim 9 wherein said counterparty credit limit is a gross counterparty credit limit.

13. A matching system in accordance with claim 1 wherein said matching criteria further comprises associated quantity value of given trading instrument bids and offers.

14. A matching system in accordance with claim 13 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

15. A matching system in accordance with claim 14 wherein said counterparty credit limit is a gross counterparty credit limit.

16. A matching system in accordance with claim 13 wherein said counterparty credit limit is a gross counterparty credit limit.

17. A matching system in accordance with claim 1 wherein said counterparty credit limit comprises the minimum of said trading party credit limits for each of said counterparties involved in said potential matching transaction.

18. A matching system in accordance with claim 1 wherein said keystation credit limit varying means comprises means for dynamically resetting all trading party credit limits assigned by said keystation means.

19. A matching system in accordance with claim 18 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

20. A matching system in accordance with claim 19 wherein said counterparty credit limit is a gross counterparty credit limit.

21. A matching system in accordance with claim 1 wherein said host computer means further comprises means for providing a credit limit alert when said assigned trading credit limit goes below a predetermined value.

22. A matching system in accordance with claim 21 wherein predetermined value comprises 25% of the original value of said assigned trading party credit limit.

23. A matching system in accordance with claim 21 wherein said keystation credit limit varying means comprises means for dynamically resetting all trading party credit limits assigned by said keystation means.

24. A matching system in accordance with claim 1 wherein said matching criteria further comprises price and quantity, said means for anonymously matching said bids and offers comprising means for determining the quantity of permissible match at the lowest common counterparty credit limit and the best bid/ask price for the largest available quantity for automatically completing said potential matching transaction.

25. A matching system in accordance with claim 24 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

26. A matching system in accordance with claim 25 wherein said counterparty credit limit is a gross counterparty credit limit.

28. A matching system in accordance with claim 27 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

29. A matching system in accordance with claim 28 wherein said counterparty credit limit is a gross counterparty credit limit.

30. A matching system in accordance with claim 1 wherein said host computer means comprises means for processing said matching transactions for a given trading instrument in time order entry to said matching system.

32. A matching system in accordance with claim 31 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

33. A matching system in accordance with claim 32 wherein said counterparty credit limit is a gross counterparty credit limit.

34. A matching system in accordance with claim 30 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

35. A matching system in accordance with claim 34 wherein said counterparty credit limit is a gross counterparty credit limit.

36. A matching system in accordance with claim 1 wherein said given trading instruments comprise foreign exchange currencies.

37. A matching system in accordance with claim 36 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

38. A matching system in accordance with claim 37 wherein said counterparty credit limit is a gross counterparty credit limit.

39. A matching system in accordance with claim 36 wherein said matching criteria further comprises real time prices of said bids and offers, said real time prices being subject to said counterparty credit limit in real time.

40. A matching system in accordance with claim 39 wherein said matching criteria further comprises associated quantity value of said given trading instrument bids and offers.

41. A matching system in accordance with claim 36 wherein said keystation credit limit varying means comprises means for dynamically resetting all trading party credit limits assigned by said keystation means.

42. A matching system in accordance with claim 36 wherein said host computer means further comprises means for providing a credit limit alert when said assigned trading credit limit goes below a predetermined value.

43. A matching system in accordance with claim 42 wherein said predetermined value comprises 25% of the original value of said assigned trading party credit limit.

44. A matching system in accordance with claim 36 wherein said matching criteria further comprises price and quantity, said means for anonymously matching said bids and offers comprising means for determining the quantity of permissible match at the lowest common counterparty credit limit and the best bid/ask price for the largest available quantity for automatically completing said potential matching transactions.

46. A matching system in accordance with claim 36 wherein said host computer means comprises means for processing said matching transactions for a given trading instrument in time order entry to said matching system.

48. A matching system for trading instruments in which bids are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to complete trades for said given trading instruments, said system comprising a host computer means comprising means for anonymously matching active bids and offers in the system by trading instrument based on a variable matching criteria, said matching criteria comprising a counterparty credit limit between counterparties to a potential matching transaction; a transaction originating keystation means for providing an offer on said given trading instrument involved in said potential matching transaction; and network means for interconnecting said host computer means, said transaction originating keystation means and said counterparty keystation means in said system

for enabling data communications therebetween, both said transaction originating keystation means and said counterparty keystation means for said potential matching transaction each having an associated counterparty credit limit, said system inhibiting completion of said potential matching transaction between said transaction originating keystation means and said counterparty keystation means when said potential matching transaction has an associated value in excess of said counterparty credit limit, said host computer means comprising means for processing said matching transactions for a given trading instrument in time order entry to said matching system, said matching criteria further comprising an order priority based on price, quantity type and said time order entry, said quantity type comprising a primary quantity type and a more quantity type, said more quantity type being a hidden value of additional quantity beyond said primary quantity a keystation is willing to trade of said given trading instrument.

50. A matching system in accordance with claim 48 wherein said counterparty credit limit is an anonymous credit limit to said counterparties.

51. A matching system for trading instruments in which bids are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to complete trades for said given trading instruments, said system comprising a host computer means comprising means for anonymously matching active bids and offers in the system by trading instrument based on a variable matching criteria, said matching criteria comprising a dynamically variable counterparty credit limit between counterparties to a potential matching transaction; a transaction originating keystation means for providing an offer on said given trading instrument involved in said potential matching transaction; and network means for interconnecting said host computer means, said transaction originating keystation means and said counterparty keystation means in said system for enabling data communications therebetween, both said transaction originating keystation means and said counterparty keystation means for said potential matching transaction each having an associated counterparty credit limit, said system inhibiting completion of said potential matching transaction between said transaction originating keystation means and said counterparty keystation means when said potential matching transaction has an associated value in excess of said counterparty credit limit, said given trading instruments comprising foreign exchange currencies, said host computer means comprising means for processing said matching transactions for a given trading instrument in time order entry to said matching system, said matching criteria further comprising an order priority based on price, quantity type and said time order entry, said quantity type comprising a primary quantity type and a more quantity type, said more quantity type being a hidden value of additional quantity beyond said primary quantity a keystation is willing to trade of said given trading instrument.

53. A matching system for trading instruments in which bids are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to complete trades for said given trading instruments, said system comprising a host computer means comprising means for anonymously matching active bids and offers in the system by trading instrument based on a variable matching criteria, said matching criteria comprising a dynamically variable counterparty credit limit between counterparties to a potential matching transaction; a transaction originating keystation means for providing an offer on said given trading instrument involved in said potential matching transaction; and network means for interconnecting said host computer means, said transaction originating keystation means and said counterparty keystation means in said system for enabling data communications therebetween, both said transaction originating keystation means and said counterparty keystation means for said potential matching transaction each having an associated counterparty credit limit, said system inhibiting completion of said potential matching transaction between said transaction originating keystation means and said

counterparty keystation means when said potential matching transaction has an associated value in excess of said counterparty credit limit, each of said keystation means comprising means for assigning a trading party credit limit, said associated counterparty credit limit being based upon said assigned trading party credit limits for each of said counterparties involved in said potential matching transaction, said host computer means further comprising means for providing a credit limit alert to an associated keystation when said assigned trading credit limit of said associated keystation goes below a predetermined value, said keystation means further comprising means for dynamically varying said assigned trading party credit limit as a result of said credit limit alert to said associated keystation.

54. A matching system in accordance with claim 53 wherein said counterparty credit limit comprises the minimum of said trading party credit limits for each of said counterparties involved in said potential matching transaction.

55. A matching system in accordance with claim 53 wherein said keystation means for dynamically varying said assigned trading party credit limit comprises means for dynamically resetting all trading party credit limits assigned by said keystation means.

57. A matching system for trading instruments in which bids are automatically matched against offers for given trading instruments for automatically providing matching transactions in order to complete trades for said given trading instruments, said system comprising a host computer means comprising means for anonymously matching active bids and offers in the system by trading instrument based on a variable matching criteria, said matching criteria comprising a counterparty credit limit between counterparties to a potential matching transaction; a transaction originating keystation means for providing an offer on said given trading instrument involved in said potential matching transaction; and network means for interconnecting said host computer means, said transaction originating keystation means and said counterparty keystation means in said system for enabling data communications therebetween, both said transaction originating keystation means and said counterparty keystation means for said potential matching transaction each having an associated counterparty credit limit, said system inhibiting completion of said potential matching transaction between said transaction originating keystation means and said counterparty keystation means when said potential matching transaction has an associated value in excess of said counterparty credit limit, said matching criteria further comprising an order priority based on quantity type, said quantity types comprising a primary quantity type and a more quantity type, said more quantity type being a hidden value of additional quantity beyond said primary quantity a keystation is willing to trade of said given trading instrument.

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